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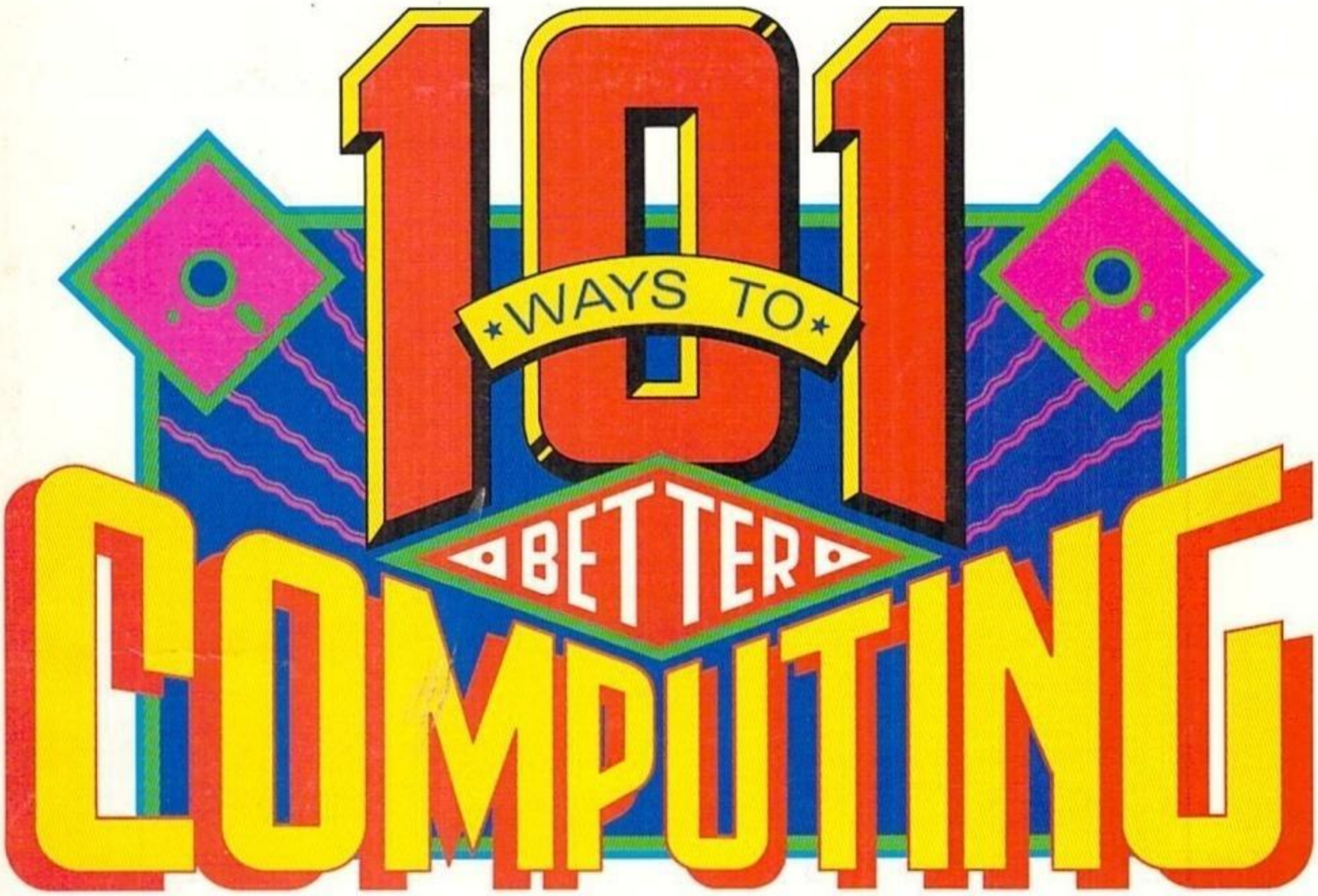

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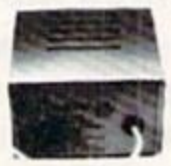

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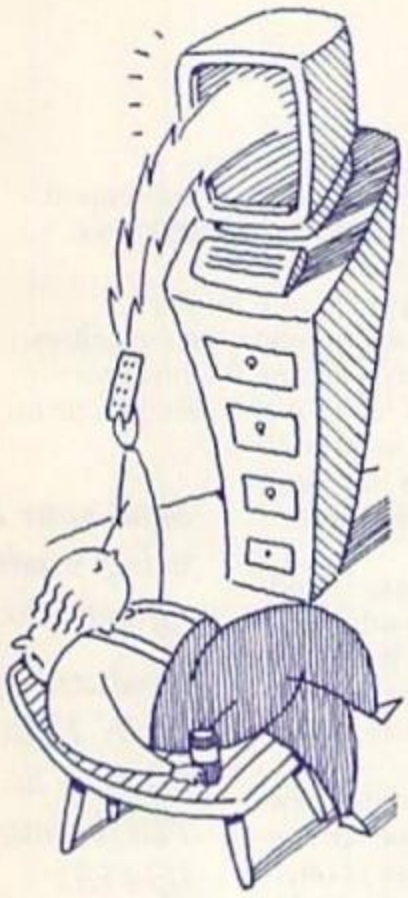


PAGE 18

FEATURES

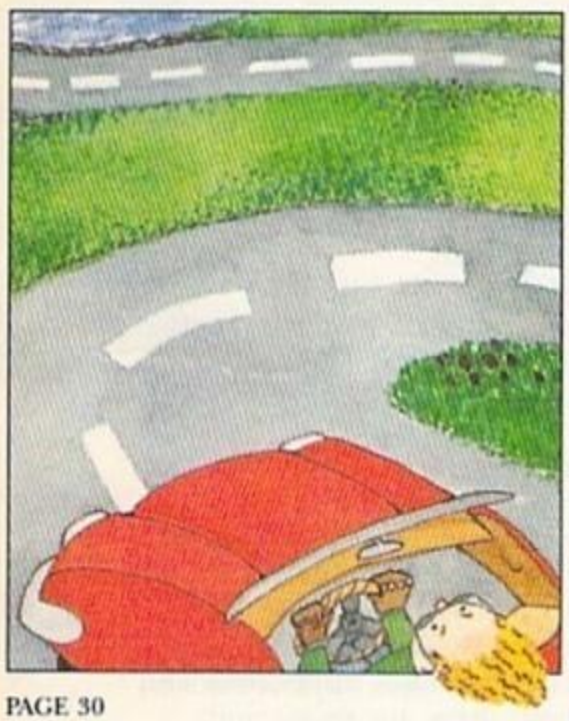
18 101 WAYS TO BETTER COMPUTING *by the* RUN *Staff*
Give yourself a pat on the back for the good computing techniques you already use. Now discover other ways you can improve your computing savvy.

***22 RUN COPY 128** *by Ed Parry*
Copy files quickly and easily between any two C-128-compatible disk drives.

***26 BASIC TAKES THE WRAP** *by Howard I. Goldman*
Make your screen text displays look professional with this C-64 word-wrapping routine.

28 A BOOSTER SHOT FOR GEOS *by Mark Jordan*
Inject Berkeley Softworks' new GEORAM expansion unit into your C-64 or C-128 to give GEOS a boost in speed.

***30 DODGE 'EM** *by Tony Brantner*
Watch out for that cruising crash car! Your defensive driving skills will be tested to the limit in this fast-action C-64 arcade game.



PAGE 30

COVER ILLUSTRATED BY JACK TOM

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DEPARTMENTS

4 RUNNING RUMINATIONS
Celebrating the Commodore as a great game machine, while acknowledging its other benefits. Also, *RUN* wants to know what productivity software secrets *you* know that you'd like to share with your fellow Commodore users.

6 MAGIC
The number-one column of hints and tips for performing Commodore computing wizardry. This month: scrolling raster stripes, generating magic number squares and salvaging disks.

9 MAIL RUN
RUN takes a few knocks while defending the freedom of the press. Plus, a reader wants to know why others spend time typing in listings.

10 NEWS AND NEW PRODUCTS
Recent developments and releases in the world of Commodore computing. A mixed bag of new products, including education, applications, a utility—even ways to make money with your computer.

12 SOFTWARE GALLERY *Reviews of:*

- Mean Streets
- Sgt. Slaughter's Mat Wars
- A Newbery Adventure: A Wrinkle in Time
- Remote Control
- Ballistix
- Frightmare
- Knights of Legend
- Sentinel Worlds I: Future Magic
- Double Dragon II: The Revenge

32 GOLD MINE *by Louis F. Sander*
Get the edge over your gaming competitors with tips guaranteed to turn you into a winner.

36 128 MODE *by Mark Jordan*
Take a look at the disk, programming and graphics utilities and productivity programs from the underground software market that are available for your C-128.

38 COMMODORE CLINIC *by Ellen Rule*
Answers to your questions about Commodore computing.

44 *RUN*'S CHECKSUM PROGRAM
Run it right the first time.

48 COMING ATTRACTIONS; LIST OF ADVERTISERS

• If you'd rather spend your valuable time using the programs in this issue instead of typing them, they are available on ReRUN disk. To order, see the card facing page 16.

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RUNning Ruminations

The battle has been raging since the dawn of time.

Productivity vs. games. Data processing vs. arcade excitement. Keyboard vs. joystick. Business vs. entertainment. Practical vs. enjoyable. IBM vs. CBM. Dollars vs. cents.

Ever since MiCro-Magnon man dragged home his first computer, he has had to justify its use to his fellow cave-dwellers. The first micro-man stated, "I'll use this machine for inventory control of my dinosaur bone collection, or to make cave art, or to record the history of man, or to study fossil remains."

Notice that he didn't mention games. He probably would have been banished to the farthest reaches of the cave.

Like our first computer-literate ancestor, modern software gatherers are reluctant to admit to using home computers to play games. Who are we kidding? A mega-dollar industry has been built up around game playing. Obviously, somebody is playing games.

After two million years, man has invented few machines that can be used for both productivity and entertainment. The home computer is one of these. The same machine that allows you to enjoy adventure-game excitement can also be used to generate a budget.

To deny either the great game-playing or productivity benefits of the Commodore computer is folly. The early Commodore ads of the 80s espoused the dual benefits of a machine that lets you do work *and* have a lot of fun. This strategy obviously helped to sell millions of computers.

RUN has always been dedicated to exploring the variety of applications of Commodore computers. The needs and interests of programmers and application users are addressed in the Magic column each month. Gamesters have the Gold Mine column.

Now may be the appropriate time to resurrect an idea we've toyed with in the past: We'd like to devote a section in each issue of the magazine to reader-submitted hints on using commercially available productivity software. It would address the needs of those users interested only in productivity. Remember, no game or programming tips! We just want your insights on using commercially available application and utility software—word processors, spreadsheets, databases and other commercial applications and utilities. Send us undocumented information—the shorter the better—that will help others use productivity software more quickly, easily and efficiently.

For instance, what program(s) would you recommend to a beginning computerist? What software purchases will help save you money? What database is best for easily adding more information or changing records? What terminal programs will support most major protocols? What about tips using GEOS?

Here's your chance to share your hard-earned secrets with other Commodore users. Not since the Stone Age has there existed such an opportunity to fill an information gap in the Commodore community. Let's make it work.

Dennis Brisson
Editor-in-Chief

Send your hints on using productivity software to:

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Due to the volume we anticipate, we will not be able to acknowledge receipt or rejection of your tips. Each accepted submission will receive a nominal payment.

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MAGIC

Scrolling raster stripes, magic number squares, and a program to conquer disk-error problems.

By TIM WALSH

$593 RASTER STRIPES 64

Raster Stripes 64, a unique raster interrupt, uses scrolling stripes to animate the C-64's screen without affecting the operation of most Basic programs. When adding the raster routine to your own programs, you may change the default gray colors of the scrolling color stripes. Use this command:

SYS 49196,C1,C2,C3,C4

where C1, C2, C3 and C4 are the value (0–15) colors of the four stripes.

POKE 56591,81 turns on the raster's movement and POKE 56591,80 turns it off. To change the speed and direction of the stripes, enter POKE 56580,X. A value of X greater than 99 makes the stripes scroll down and values less than 99 make them scroll up.

```
Ø REM RASTER STRIPES 64 - JEFFREY PANICI
                                        :REM*63
1Ø FORT=49152 TO 49273:READ D:POKE T,D:NEX
   T                                    :REM*196
2Ø DATA 72,138,72,152,72,164,2,2ØØ,192,16,
   2Ø8,2,16Ø,Ø,132,2,185,28,192    :REM*176
3Ø DATA 141,33,2Ø8,141,33,2Ø8,76,81,254,1,
   3,6,14,1,3,6,14,1,3,6,14,1,3,6  :REM*36
4Ø DATA 14,32,155,183,134,251,32,155,183,1
   34,252,32,155,183,134,253,32    :REM*153
5Ø DATA 155,183,134,254,165,251,141,28,192
   ,141,32,192,141,36,192,141,4Ø   :REM*253
6Ø DATA 192,165,252,141,29,192,141,33,192,
   141,37,192,141,41,192,165,253    :REM*63
7Ø DATA 141,3Ø,192,141,34,192,141,38,192,1
   41,42,192,165,254,141,31,192     :REM*2Ø
8Ø DATA 141,35,192,141,39,192,141,43,192,9
   6,153                            :REM*239
9Ø POKE 53281,.:POKE 2,.:POKE 792,.:POKE 7
   93,192                           :REM*43
1ØØ SYS 49196,1,11,12,15            :REM*228
11Ø POKE 5658Ø,1ØØ:POKE 56581,1:POKE 56582
    ,.:POKE 56583,.                 :REM*155
12Ø POKE 56589,13Ø:POKE 5659Ø,17:POKE 5659
   1,81                             :REM*24
13Ø PRINTCHR$(147)"{CTRL 8}THIS PROCESS GI
   VES A 3-D EFFECT"                :REM*11
14Ø PRINT"WHEN TEXT IS ADDED TO THE SCREEN
   !"                               :REM*16
```

—JEFFREY D. PANICI, SANDWICH, IL

$594 MAGIC SQUARE 128

Here's a unique trick for the C-128's 80-column screen. When you run Magic Square 128, enter an odd number from 3 to 9. A square made up of numbers in rows and columns will appear, with the number you chose determining the size of the matrix (e.g., entering 3 will make a square three numbers across and three down). It's called Magic Square 128 because the sums of all rows and columns and both diagonals are the same! Study the Basic listing to unlock the key to this bit of Magic.

```
Ø REM MAGIC SQUARE 128 - HENRY LANGSTON
                                        :REM*141
1Ø FAST:SCNCLR:X=INT(RND(Ø)*9):CHAR,28,8,"
   M A G I C{2 SPACEs}S Q U A R E S":CHAR,
   22,16,"SELECT SQUARE SIZE":CHAR,22,18,"
   ENTER AN ODD NUMBER FROM 3 TO 9":REM*8Ø
2Ø CHAR,22,2Ø, "EVEN NUMBERS GO TO NEXT OD
   D NUMBER":GETKEYN$:N=VAL(N$):IF N<3ORN>
   9 THEN 1Ø:ELSE SCNCLR:IF N=INT(N/2)*2 T
   HEN N=N+1                        :REM*242
3Ø WINDOW 41-N*2,12-N,79,24:C=INT(N/2)+1:R
   =1:FORL=1TON*N:S(C,R)=L+X:IF L/N=INT(L/
   N)THEN R=R+1:GOTO4Ø:ELSE C=C+1:R=R-1:IF
   C=N+1THEN C=1:ELSE IF R=ØTHEN R=N
                                        :REM*1Ø6
4Ø NEXT:FORL=1TON:FORK= 1 TO N: IF S(K,L)<
   1Ø THENPRINT" ";                 :REM*232
5Ø PRINTS(K,L);:NEXT:PRINT:PRINT:NEXT:WIND
   OWØ,Ø,79,24:CHAR,29,24,"PRESS A KEY FOR
    REPLAY":GETKEY I$:GOTO1Ø        :REM*48
```

—HENRY LANGSTON, KISSIMMEE, FL

$595 DISK SALVAGE 64

Bad disk errors are troublesome at best, and potentially destructive to data, programs and anything else saved to a disk containing them. One or more bad sectors are usually the cause. But then, what can you do about it?

The answer is Disk Salvage 64. This C-64 program checks every track and sector on any 1541- or 1571-formatted disk to find any errors. All bad sectors are allocated so that further disk damage won't occur. Once it's finished, you can copy most files onto a new work disk, using a copy utility, and the original error-prone disk can then be reformatted.

```
Ø REM DISK SALVAGE 64 - SAUL BETESH:REM*8Ø
1Ø C$=CHR$(147):PRINTC$"INSERT A DISK AND
   PRESS A KEY"                     :REM*164
2Ø GETA$:IF A$=""THEN 2Ø            :REM*212
3Ø DIM ET(1ØØ),ES(1ØØ),EM(1ØØ)      :REM*177
4Ø X=1:PRINTC$                      :REM*226
5Ø OPEN15,8,15,"U;":OPEN 2,8,2,"#" :REM*21
6Ø GOSUB 19Ø:IF EF THEN END         :REM*249
7Ø FOR T= 1 TO 35:FOR S= Ø TO 2Ø+2*(T>17)+
   (T>24)+(T>3Ø)                    :REM*219►
```


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```
8Ø PRINT C$"TRACK"T"SECTOR"S"ERRORS"X-1
                                        :REM*247
9Ø PRINT#15,"U1:"2;Ø;T;S:GOSUB 19Ø :REM*82
1ØØ IF EF=Ø THEN 14Ø                  :REM*154
11Ø PRINT#15,"B-F:"Ø;T;S              :REM*249
12Ø PRINT#15,"B-A:"Ø,T,S               :REM*9Ø
13Ø ET(X)=T:ES(X)=S:EN(X)=ER:X=X+1   :REM*6
14Ø NEXT:NEXT:CLOSE15                 :REM*16Ø
15Ø PRINTC$;"ERRORS FOUND = "X-1:PRINT
                                       :REM*8Ø
16Ø FOR J = 1 TO X-1                   :REM*24
17Ø PRINT"ERROR="EN(J)"T="ET(J)"S="ES(J)
                                      :REM*17Ø
18Ø NEXT:END                           :REM*41
19Ø INPUT#15, ER, E$, E1, E2          :REM*217
2ØØ EF=1+(ER=Ø OR ER=65 OR ER=73) :REM*247
21Ø RETURN                             :REM*97
```

—SAUL BETESH, KINGSTON, ONTARIO, CANADA

$596 FILE SLICER 64/128

File Slicer 64/128 divides large text files downloaded from bulletin boards and on-line services into smaller segments so that they can be loaded into a word processor. It works on both the 64 and 128 with any Commodore disk drive and possesses superb accuracy even when used with massive (500-plus disk blocks) text files.

When you run the program, you'll be prompted for the name of the file to be "sliced," followed by the filenames for the new files that File Slicer creates. You'll then be asked for the total number of disk blocks in each segmented file. When the process begins, the segmented filenames automatically have the letters A, B, C, and so on appended to them. Be certain beforehand that there's sufficient room on your disk for the new files.

```
Ø REM FILE SLICER 64/128 - JEFFREY PANICI
                                       :REM*38
1Ø PRINT CHR$(147)"FILE SLICER 64/128"
                                      :REM*254
2Ø PRINT"{2 CRSR DNs}":POKE 19,3:INPUT"FIL
   E TO READ:";F$                      :REM*74
3Ø PRINT"{CRSR DN}":INPUT"NEW FILENAME:";N
   $:IFLEN(N$)>14 THEN GOTO Ø      :REM*138
4Ø PRINT:INPUT"{CRSR DN}BLOCK'S PER FILE:"
   ;B$:B=VAL(B$):POKE 19,.:PRINT"{2 CRSR D
   Ns}"                               :REM*231
5Ø N=.:OPEN 8,8,8,F$+",S,R":GOSUB 12Ø
                                       :REM*4Ø
6Ø OPEN 2,8,2,N$+"."+CHR$(N+65)+",S,W":PRI
   NT"{CRSR DN}WRITING ... "+N$+"."+CHR$(N
   +65)                                :REM*31
7Ø FOR X=1 TO 254*B                   :REM*112
8Ø GET#8,A$:IF ST=64 THEN CLOSE8:CLOSE2:PR
   INT"{2 CRSR DNs}DONE.":END      :REM*165
9Ø PRINT#2,A$;                        :REM*24Ø
1ØØ NEXT                             :REM*23Ø
11Ø N=N+1:CLOSE 2:GOTO 6Ø            :REM*24Ø
12Ø OPEN15,8,15:INPUT#15,E,E$:IF E=. THEN
    RETURN                           :REM*199
13Ø PRINT E,E$,E:CLOSE 8:END         :REM*226
```

—JEFFREY D. PANICI, SANDWICH, IL ■

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MAIL RUN

RUN takes a few knocks while defending freedom of the press.

FORERUNNER

I was a *Commodore Magazine* subscriber until it merged with *RUN*. I'm pleased to see that your Magic column is similar to *Commodore*'s Tips and Tricks column. I was even more impressed to see that you also included Louis F. Sander's gaming tips column, Gold Mine.

—RYAN OWENS
CINCINNATI, OH

RUN's Magic column was actually the forerunner of the two Commodore Magazine *columns you mentioned, Ryan. Both programming tricks and game tips were included, and Lou Sander was the column's original author. We're glad you enjoy* RUN.

—EDITORS

WHY DO THEY DO IT?

Being retired, I'm on a tight budget, so I really couldn't afford a subscription to *RUN*'s ReRUN disk, but the time it takes me to type in one or two listings from the magazine I could spend working part time. Then, I'd have the money for the subscription in a week or two.

I still buy *RUN* magazine for the features ReRUN doesn't have, like Magic and Commodore Clinic, articles, reviews and, of course, Mail RUN.

I'm curious, though, to know how many of your readers actually spend time typing in listings.

—F. E. BARKER
MIMS, FLORIDA

We invite readers' responses to these comments. According to our most recent editorial survey, 80 percent of RUN *readers have typed in program listings from the magazine. We assume that a large percentage of those who don't enter program listings avail themselves of the ReRUN disk.*

—EDITORS

THAT'S THE WAY THE COOKIE CRUMBLES

There has been a small mixup. We sent you a UPC label-maker program some time ago. In the News and New Products column in February, it was described as a software release, but we are not a software company! We are a bakery that uses a C-128 to help us run our business.

We sent you the program in response to other users wanting productivity software for the C-128. Our intention was simply for *RUN* to publish the listing.

—ROBERT PISKAC, JR.
CLEVELAND, OH

Gee, Bob, the information you sent us made us think that your program was *a new product. Unfortunately, it's too long to publish in* RUN, *and the subject matter is a little esoteric for our readers.*

But, why do you call your bakery Piskac Bakery Software?

Since your bakery is now known to 200,000 readers with sweet tooths, how about sending the RUN *editorial staff a couple of dozen of your fresh pastries?*

—EDITORS

FREEDOM OF THE PRESS?

You proved again that freedom of the press is enjoyed by those who own the presses.

Some Mail RUN readers may not recognize that you set up a Mail RUN contributor (see "Commodore vs. the Clones," Mail RUN, December 1989) to make him the main target of their responses. You used your freedom of the press to suggest not only that other readers respond, but even suggested the tack they might take.

However, his points are well taken and correct. Look to your own pages for substantiation. What products are advertised more prominently than others—productivity software or games and entertainment software?

The majority of Commodore software in your pages, as well as in mail order house catalogs, is games and entertainment software.

Commodore is getting out of the C-64/128 business. Why? Because games don't pay the bills.

Your attempt to use smoke and mirrors and to lead the discussion away from his main points failed to work on all your readers.

—BOB JACKSON
PROTEM, MO

You misunderstand the purpose of this column, Bob. We invite readers to share their opinions and comments, however unenlightened, with other readers, just as you are doing. But, when someone insults hundreds of thousands of Commodore owners and a significant part of the computer industry, we suppose he should expect to dodge a few arrows.

—EDITORS

LONG LIVE THE C-64 AND C-128

I'm disappointed that Commodore's management has decided not to continue supporting its C-64 and 128 computers. I'm appalled that they're relinquishing their leading position in the home computer market. It seems that Commodore's executives are the company's own worst enemies.

—S. W. HALL
GREENVILLE, SC

While Commodore has stopped production of the C-128, company officials state that they will continue supporting the C-64. RUN *will continue to support both machines.*

—EDITORS

WHO CARES?

RUN is beginning to sound like a broken record. Every month brings a new editorial bemoaning Commodore's abandonment of the C-128 for the Amiga line, and a host of letters from readers wringing their hands over the lack of support from the big "C." Who really cares? What audience are you targeting anyway? It seems logical that those who shell out $2.95 for your magazine already believe the 8-bit machine is the greatest thing since sex, so why do they need a pep talk on the subject?

—EUGENE PEETE
HAMBURG, WEST GERMANY ■

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NEWS AND NEW PRODUCTS

Come to grips with your joystick; print labels from predesigned layouts; and debug your programs.

By HAROLD R. BJORNSEN

GET A GRIP ON YOUR JOYSTICK

WARWICK, RI—Duggan DeZign (300 Quaker Lane, Suite 7, Warwick, RI 02886) introduces the **Stik-Gripper**, an adjustable steel clamp that secures your joystick to a tabletop, thus simulating a real arcade game and leaving one hand free for keyboard operation. Included pads and caps protect the table and joystick. It's available for $18.95.

Check Reader Service number 400.

TAKE A TIP FROM LOU

BLUE RIDGE SUMMIT, PA—***Lou Sander's Gold Mine: Game Tips for Commodore Users*** features 1200 tips and tricks for more than 500 computer games. These "gold nuggets" help the gamester master every type of game, from Breakthru and Defender of the Crown to Gunship and Legacy of the Ancients. The large-format book is available in hardcover ($28.95) and paperpack ($19.95) from Tab Books, Inc., Blue Ridge Summit, PA 17294.

Check Reader Service number 405.

ROCKYSOFT DEBUGGER

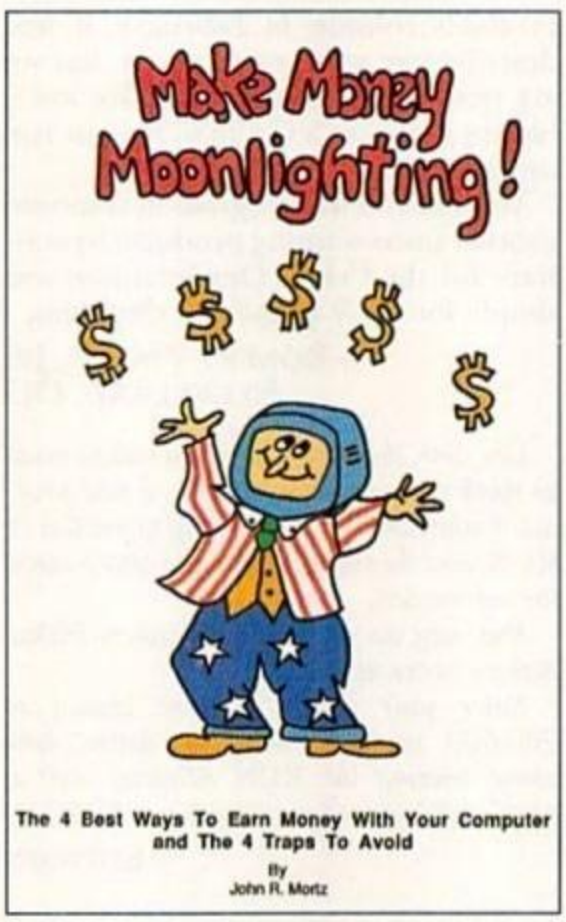
LANGTON, ONTARIO, CANADA—**Diamond Symbolic Debugger**, a C-128 programmer's utility, has 70 commands to help you debug machine language programs produced by other assemblers, Pascal or C compilers. Also included are an assembler and disassembler; six Disk, two Print and 11 Execute commands; and eight commands to display or modify memory. The $29.95 package is available from RockySoft, PO Box 113, Langton, Ontario, Canada N0E 1G0.

Check Reader Service number 403.

MOONLIGHTING

PASADENA, CA—***Make Money Moonlighting! The 4 Best Ways To Earn Money with Your Computer and the 4 Traps To Avoid*** is for Commodore owners who want to start a business with their computers. It contains business development information and describes methods for starting those businesses. Checklists include analyzing competitors and implementing the best marketing ideas. The book is available from The American Institute of Computer Technology, 30 N. Raymond Ave., Suite 714, Pasadena, CA 91103. $9.95 plus $2.50 s/h.

Check Reader Service number 401.



This 121-page book shows you how to make money in word processing, desktop publishing, shareware development and computer consulting.

FASTER THAN A SPEEDING ELECTRON

NEWARK, NJ—Bell Laboratory researchers have unveiled a prototype computer that uses light instead of electrical impulses to process data.

Within a decade, it could lead to the development of light-based supercomputers operating up to 10,000 times faster than current machines, said Brian Monahan, a spokesman for Bell Labs.

The prototype data processor—an assembly of lasers, lenses and prisms in a two-foot-square box—is the first to transmit information with light rather than electricity. The technique could allow a much greater flow of data. Scientists believe it can eventually be reduced to the size of today's microchips.

Unlike current computer chips, information would pass not just from a chip's edges but also from its surface. Bell Labs physicist David Miller likened the development to a Manhattan island in New York City where cars suddenly weren't limited to bridges and tunnels, but could leave through the air, much like a flying DeLorean.

LABELS GALORE

PITTSBURGH—**Label Maker**, a C-64 program for making labels, has been released by Keystone Software (PO Box 8369, Pittsburgh, PA 15218). There are predesigned layouts for 11 different types of labels, such as those for file folders, hand-fed and continuous envelopes, disks and rotary file cards. You can also create labels of your own design, using the font and color capabilities of your printer or interface. It retails for $29.95.

Check Reader Service number 402.

LEARN TO THINK

PLEASANTVILLE, NY—In **Safari Search**, an educational package for the C-64, school children from grade 2 through high school develop their inference skills. They can work with 12 activities involving searching for one or two animals on a five-by-five grid. The program helps students to gather and record information, apply what they've learned, analyze situations and evaluate options.

Included are a video to help students develop thinking skills, a teacher's guide and a bonus lesson plan. Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570. Prices are $65 for the single package and $195 for the 10-disk lab pack.

Check Reader Service number 407. ■

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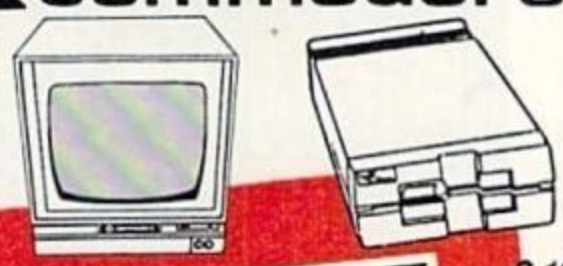

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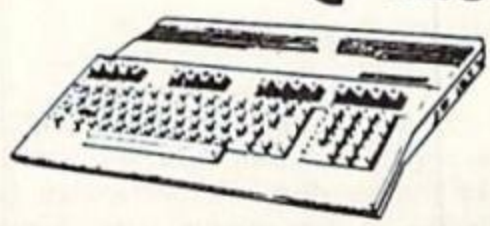

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SOFTWARE GALLERY

From the ring to the streets, from dreams to TV, this month's roundup of reviews ranges far and wide.

By BETH S. JALA

MEAN STREETS ..... A–

Magnum, P.I.
Of the Future

On a Saturday evening in 2033, for no apparent reason, Professor Carl Linsky took a dive off the Golden Gate Bridge. A few nights later, Linsky's blonde, blue-eyed daughter shows up at your office. Convinced that her father did not commit suicide, she hires you (a.k.a. Tex Murphy, private investigator) to find the professor's murderer. For $10,000 and the chance to spend your evenings with the curvaceous Ms. Linsky, you set out to discover the truth.

After inserting the destination code into the navigational computer, you travel between various California locations aboard your Lotus speeder (flying car). From the cockpit, you can contact your secretary or informant, check your inventory, save or load any of ten games, as well as control your speeder and get a view of what lies ahead. Although you'll find the Lotus much easier to maneuver than most flight simulators, you might prefer to choose the foolproof Autopilot mode.

At some places, you receive pertinent textual clues or notification that you are following a "red herring." At others, you may question, bribe or threaten people you meet to get information (e.g., destination coordinates). Each of these interactive screens contains a digitized photo of a character, overlapping an attractive drawing of his or her neighborhood.

All requests must be typed in. The game doesn't tolerate mistakes or incomplete names. Thankfully, however, the joystick is used for searching rooms. Employing a multi-menu system, the flick of a handle or the press of a button lets you discover clues, gather objects, uncover traps and shut down security systems. Items can be stored without limit, and many may be sold to raise bribe money.

Occasionally, you'll have to fight a gun battle in order to arrive at your destination. Defeating your opponents and crossing over to safety uses up a lot of ammunition. Be sure to carefully examine rooms for additional rounds. Otherwise, you'll have to fly to bounty areas and defeat more formidable enemies to earn extra bullets.

Looking for clues is the name of the game in Mean Streets.

Gun fights lack variety and appear to occur where they do for no particular reason. After a while, these and the flight simulation sections become tedious, as does the amount of disk swapping necessary to load the various screens.

These minor annoyances aside, Mean Streets offers great depth of game play and enough mystery and mayhem to keep amateur sleuths on edge for quite some time. *(Access Software, 545 West 500 South, Suite 130, Bountiful, UT 84010. C-64/$39.95.)*

—LEN POGGIALI
SYRACUSE, NY

REPORT CARD

A Superb!
An exceptional program that outshines all others.

B Good.
One of the better programs available in its category. A worthy addition to your software library.

C Average.
Lives up to its billing. No major hassles or disappointments here.

D Poor.
This program has some problems. There are better on the market.

E Failure.
Many problems; should be deep-sixed!

SGT. SLAUGHTER'S MAT WARS ..... B

Will You Make It To the Big Time in Vegas or Atlantic City?

Over the last five years, Mindscape has released a series of excellent wrestling-related games. Although the company's latest grappling software, Sgt. Slaughter's Mat Wars, also has some very attractive features, many players will probably find it to be far more frustrating than its predecessors.

The title character is G. I. Joe's most famous friend. He serves both as master of ceremonies and referee throughout the program.

You begin by evaluating five managers and choosing the one whose negotiation skills will be most helpful later in the game. Then it's on to an auction house, where you bid on and buy the contract of an up-and-coming young wrestler.

The next phase of the program takes place in an old, run-down arena. Here your joystick-controlled man furiously battles other grapplers both within and outside of the ropes. Conquering them transports you to a more prestigious stadium, where similar success earns a shot at the championship in the glamorous Coliseum.

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fixing certain bouts, and recoup some bribe money by setting up and winning side bets.

Employing an innovative control system, you start out with four different wrestling moves at your command. By successfully using them to stun his opponent, your man reaches a new ability level, with its own unique set of maneuvers.

Complementing the program's impressive repertoire of attack moves are superb graphics and animation. Each scene is colorful and skillfully drawn, and the ring warriors' movements are fluid and lifelike.

Fight your way out of the back-alley dive in Sgt. Slaughter's Mat Wars.

On the other hand, the software suffers from periods of relatively long dead time as data is loaded from disk. For instance, the minimum wait between two bouts is more than a minute and a half.

Also, the game is very tough to beat, so much so that many novice players will suffer through a seemingly endless series of defeats before enjoying any success.

As a result, Sgt. Slaughter's Mat Wars might not be for everyone. But it will probably be the program of choice for those wrestling fans who are up to an extremely challenging test of their electronic grappling skills. *(Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. C-64/$29.95.)*

—WALT LATOCHA
OAK PARK, IL

A NEWBERY ADVENTURE: A WRINKLE IN TIME ..... B–

Computerizing a Literary Experience

What child can resist a story in which the characters are named Mrs. Whatsit, the Man with the Red Eyes, and IT? These are some inhabitants of Madeline L'Engle's highly regarded (and best-known) novel, *A Wrinkle in Time*. An excellent piece of children's literature and part of the core curriculum for many U.S. school districts, it now also provides the content for an educational program geared to grades four through eight.

In the story, Meg Murry and her young brother, Charles Wallace, aided by three supernatural beings who take the form of eccentric old ladies, travel through the universe in search of the children's missing scientist father. They land on a planet of mindless conformity, where Charles submits to the control of an evil disembodied brain called IT. Meg rescues Charles, and the children return home.

The Sunburst program reinforces vocabulary and comprehension skills in an interactive format that provides students with two activities. The first tests their understanding of vocabulary words that appear in the novel; the second asks students to choose options that reflect the actual sequence of events in an adventure.

One nine-year-old devotee of this novel happily pronounced as "gross" the colorful graphics that accompany each vocabulary exercise and each scene in the adventure—a high honor, indeed. Wavy, colored lines scroll across the screen when the characters "tesser" (travel through space).

Teachers can modify the adventure section of the program by extending or compressing the number of choices allowed to successfully complete it. The difficulty level in the vocabulary exercises can also be adapted to student needs. Level 1 is multiple choice, 2 is fill-in-the-blank with a hint, and 3 is fill-in-the-blank with no hint. In each case, students are presented with ten statements relating to the story, and these vary each time the option is used.

The Multiple Choice option seems appropriate and likely to be effective. The Fill-in-the-Blank options are problematical, however; without a word list, students can guess appropriate words for the context of the sentence and still be "wrong." Unless they memorize the book, it seems unfair to expect students to guess, for example, that "compulsion" fits the sentence "Our journey begins after Calvin has a strong feeling that he must go to the haunted house. He follows his _____." My guess was "intuition."

The Teacher's Guide includes program objectives, a vocabulary list, a direct adventure path and several student worksheets. Although it suggests that students write definitions of words or look them up in the dictionary, no definitions or pronunciations are given for the teacher. Nor are teachers provided with the sentences in the novel that actually use each of the tested words—information that would be useful for truly teaching vocabulary in relation to context.

This program cannot stand alone—it would not be effective without the novel. However, it's certainly a welcome, albeit incomplete, supplement for a unit on *A Wrinkle in Time*. Although both the adventure and the vocabulary exercises are limited, they should reinforce the concept of plot sequence and encourage reluctant readers to complete the novel. Students who have read the novel carefully will enjoy completing the adventure. *(Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570. C-64/single package, $65; 10-disk lab pack, $195.)*

TIME LEFT
36
USE <> TO MOVE, THEN PRESS RETURN.
Charles and Meg meet Calvin near the haunted house. Charles decides to
go to Calvin's house to see his family.
leave because he is afraid of Calvin.
take Calvin to the ladies for approval.

The multiple choice aspect of A Wrinkle in Time.

—SHARON G. WEINER
CHICAGO, IL

REMOTE CONTROL ..... B–

Try Your Talent At TV Trivia

Die-hard fans of MTV's game show, Remote Control, can thank Hi Tech Expressions for creating a successful computer version of this popular TV trivia contest.

Up to three players can compete against one another, or the program will provide competent computer opponents as needed. You select your on-screen personna from a yearbook that features eight characters, ranging from an all-American girl to an unshaven "burn-out."

The main part of the game consists of two rounds of questions. The nine categories per round focus, for exam- ►

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Newsroom	14
Photo Finish	19
Poster Maker 128	24
Printmaster Plus	25
Printshop	30
Screen F/X	25
Sketchpad 128	24
Spectrum 128	29

PERSONAL

Bible Search KJV	$20
Bible Search NIV	**25**
Bridge 5.0	20
Dream Machine Analyze/64	19
Family Tree C64/C128 and LDS	39
Great War	15
Tarot 128	15

UTILITIES/LANGUAGES

1541/1571 Drive Alignment	$25
1581 Toolkit V2/ Dos Ref	29
Basic 8	29
Basic 8 Toolkit	17
Basic 8-How to Get the Most Out of	17
Basic Compiler/128	39
Basic Compiler/64	29
Big Blue Reader V3 (64/128)	32
Bobsterm Pro 128	42
C128 Advanced User Package	45
C128 Programmer's Delight	45
CP/M Kit	22
CSM Newsletter Compendium	29
Cobol 128	29
Digitalker 128	20
Gnome Kit 64/128	29
Kracker Jax Super Cat	22
Kracker Jax Vol 1-7 + Shotgun2	27
Maverick V4.0 Copier	29
Merlin 128	45
Super 81 Utilities 128 or 64 each	29
Super Aide 64	25
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ple, on specific shows (e.g., "Happy Days"), types of programs (e.g., "Reruns") and educational skills. Examples of the last are "Brady Physics," which poses science questions involving characters from The Brady Bunch series, and "Shakespeare TV," which presents clues in the language of the Bard.

You choose questions from a nine-channel, TV-screen gameboard. Eight of the channels contain three questions of increasing value. The ninth hides a surprise, such as advice from Ranger Bob or tips from "Home Shopping Zone," which costs you ten points. Whenever a new category is selected, the emcee appears and delivers a witty remark. Make a mistake, and he's ready with an insult.

PLAYER 1 SELECT A CONTESTANT.
CHARLIE
USE THE LEFT/RIGHT CURSOR KEYS TO TURN THE PAGE.
PRESS RETURN TO SELECT A CONTESTANT.
SARAH

You have various choices when selecting your character in Remote Control.

After a question flashes across the screen, the first player to "buzz" is allowed 20 seconds to type an answer. If it's wrong, the others are given a chance. The person responding correctly chooses the next question, and so on until none remain. Replies are "buzzed in" via separate keys, spaced far apart on the keyboard to facilitate play by three individuals.

A Snack Break—food falling on the contestants from above—occurs between rounds. The low scorer is eliminated during the second round. The two remaining players compete in the "Think Real Fast" game, where they have 30 seconds to answer as many questions as possible, each one worth 25 points. The person with the highest score wins at the end of the round.

Remote Control's many virtues include colorful, animated graphics, enough questions to last for a fairly long time and a good-natured sense of humor. On the down side, the game sometimes crashes while loading new questions. Although scores are tallied correctly, the wrong person is occasionally declared winner. The program's greatest drawback is the lack of a penalty for incorrect replies. This leads to a lot of wild guessing.

If you're tired of music videos, but your taste for tasteless trivia is unquenchable, shut off MTV, turn on your computer and play Remote Control. *(Hi Tech Expressions, 584 Broadway, New York, NY 10012. C-64/$14.95.)*

—LEN POGGIALI
SYRACUSE, NY

BALLISTIX ..... B–

Certainly a Different Way To Play Ball!

Ballistix's package indicates that the game resembles soccer and pinball. However, players will probably notice its marked similarity to the youthful sport of shooting marbles.

A game begins with a large black ball appearing on a rectangular field. Using a movable, joystick-controlled cannon, you shoot silver pellets at the ball to nudge it away from your goal and toward your opponent's goal.

Complicating matters are all sorts of obstacles and objects that materialize on the game's 64 levels. In addition to barriers, bumpers, ramps and tunnels, there are arrows in the floors that accelerate the black ball up to extraordinary velocities, as well as magnets that drag it away from your control. And inadvertently guiding the sphere into an on-screen acid pool causes the ball to rapidly melt away.

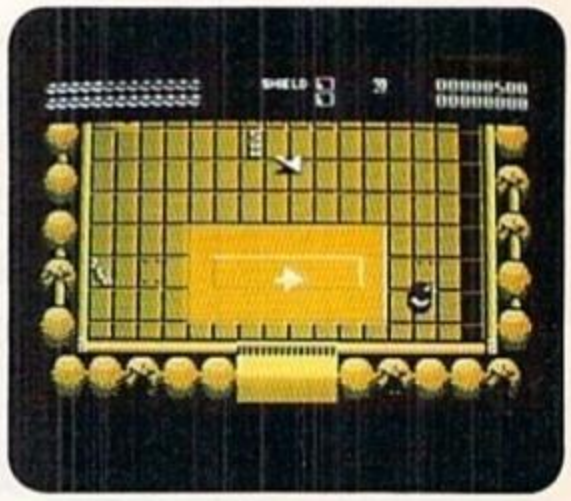
In two-player competition, you strive against a human opponent, who controls his or her own cannon. In one-player games, only your gun appears as you battle against gravitational forces that constantly draw the ball toward the goal you defend.

The program encourages customized play by allowing for the adjustment of eight different factors. You can, for instance, select the starting level for a gaming session and also determine how far pellets will travel before they fade from the screen.

Unfortunately, the game's documentation is too brief, requiring quite a bit of experimentation to determine just what the software is capable of. I especially missed explanations of the effects that some on-screen objects have on gameplay.

Also, some players will be annoyed by the program's suspensions of the laws of physics. For example, although striking a sphere left of center causes it to roll to the right in the real world, such a blow in Ballistix often moves the ball in the opposite direction. This confusing lack of realism tends to reward tactics that emphasize fusillades of pellets rather than precise single shots.

Compensating for the problems are nicely done sound effects and terrific graphics and animation. They make for an exciting experience. In fact, it is Ballistix's sensory frills that are its major attraction. For some, that might be sufficient justification to purchase this high-tech version of an enjoyable childhood pastime. *(Psygnosis, PO Box 483, Addison, IL 60101. C-64/$29.95.)*



Remember: arrows on Ballistix's playing field accelerate the black ball!

—WALT LATOCHA
OAK PARK, IL

FRIGHTMARE ..... C+

Dreams and Nightmares And Trance States, Oh My!

It's midnight and you're here, where bad dreams become visions of terror and nightmares turn into "frightmares!" Instinct urges you to flee the horrors of this twisted landscape. But, why be in such a hurry to get out? Why not climb those vines, swing over that nasty looking werewolf, pick up those bullets, and "go for it!"

As fate would have it, just when you decide actually to seek out your worst nightmare, it suddenly becomes most elusive. Hordes of zombies, ghosts, serpents and other baddies can't wait to extinguish your five dream lives and send you back to wakefulness. To top it off, you discover that your current bad dream is merely the lowest rung on a hierarchy of truly nightmarish proportions. Yet to be achieved are 14 levels of Dream (like Cruel, Terrible and Murderous); then, you can tackle the next six dream states (Vision, Trance and

Continued on page 40.

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Australian Commodore and Amiga Review

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101 WAYS TO BETTER COMPUTING

Discover these time-tested tips to save minutes and money and increase your computing pleasure a hundredfold.

By *RUN* EDITORS

SETTING THE STAGE

(Or, advice on arranging your equipment.)

► The type of flooring you use in your computer room is important to the life of your equipment. Cushioned vinyl or carpeting made of low- or non-static material are good bets. Alternatively, you can install a static mat under the computer zone or locate antistatic buttons or conductive foam pads on the furniture.

► Don't put your power supply on the floor, especially if it's carpeted.

► Set up your computer equipment so air can flow around it (including underneath); never block any vents. Overheating reduces a computer chip's life.

► If you must do your computer work in a confined space, set up a fan so that it moves air over your equipment.

► If you put rubber feet or wooden blocks under your Commodore for air flow, make sure you provide support for your modem or anything else that attaches to the user port to prevent strain on the connectors.

► Don't prop up your computer equipment with metal; it can generate a magnetic field that may destroy data or interfere with your machine.

► Keep your power supply as far away from your monitor as possible to minimize interference.

► Locate proper lighting at your computer work area if overhead lighting is insufficient or unavailable.

► Eliminate the sources of glare on your computer screen. For example, never position your screen directly in front of a window.

► Move computer hardware away from windows to prevent exposure to direct sunlight, temperature fluctuations and weather elements.

► Keep your disks away from the electromagnetic radiation of a motor or TV tube; also keep them away from refrigerators, stereos, telephones, vacuum cleaners and metallic objects.

► Keep cables and equipment away from any sources of stray electrical signals, such as motors or transformers.

► Arrange cords, cables and other plug-ins so that you can't trip over them and accidentally unplug the computer.

► Tie up unused monitor, drive or printer cables with rubber bands or twist ties.

► Label each cable to help simplify identifying the tangle of wires and connectors behind your computer. You'll appreciate this the next time you have to unplug your disk drive or interface.

► Label the sockets that correspond to each cable. Attempting to plug, for example, a power supply input into a monitor socket could prove disastrous.

► Use a separate, private line for your modem—don't connect it to an extension jack of your house phone.

► Isolate your system with a power strip that has its own switch and fuse.

► Use a mousepad with your mouse.

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WHY DIDN'T I THINK OF THAT?

(Or, commonsense computing shortcuts and care.)

► Consider joining or starting a user's group to exchange Commodore information.

► When transporting your disk drive, insert an old disk or cardboard head protector into it. Then place the drive in its original box or pack it firmly with styrofoam popcorn in another.

► Let any disk that has been exposed to cold temperatures warm slowly to room temperature. Wait at least one day before using it. If you record on a cold disk, you may not be able to read it when it's warm.

► Loading problems can occur when high humidity causes the interior of your disk envelopes to become slightly damp. Reduce this problem by storing your disks with a desiccant bag or capsule (such as those packed with vitamins).

► Seal printer ribbons, disks and other accessories in moisture-proof packaging to keep them from drying out or being contaminated by dust. Store disks upright, at moderate room temperature, and protect them from light.

► Generally, anything that puts pressure on a disk's surface may damage it (writing on a disk label with a ballpoint pen, for example).

► If you have a lot of files on a disk, print out a directory and tape or glue it to the disk sleeve. Then you'll know, at a glance, what files are on your disk.

► Employ a color-coded system if you use a lot of disks.

► Turn a radio on and place it first on the left side of your monitor and then on the right. Put your disk drive on the side of the monitor that appears to pick up the least interference.

► To avoid having static electricity destroy a joystick port, put a piece of black electrical tape over the ports. It will insulate them against static charges, won't gum up the ports and can easily be removed to plug in a joystick. Also, remember to keep fingers and foreign objects away from all ports.

► If new equipment is going to fail, it will usually happen early in its life. So, make it a practice to "burn in" new equipment: Leave it powered up round-the-clock for about 72 hours after assembly to see whether it continues to function normally. If it doesn't, you can get it replaced while it's still under warranty.

► If your keyboard gets wet, turn off the power, unplug the machine, and let it dry for at least 24 hours.

► Do not simultaneously power up several machines or pieces of equipment; this can cause a brief but harmful power surge. Turn on your peripherals, then your computer; reverse the action to shut down your system.

► Don't plug in or unplug a printer or disk drive, either at the computer or the peripheral, while the peripheral is on.

► Make sure all plugs are firmly implanted and have no pressure on them. A plug that is in crooked may make a poor contact or cause a short.

► Never unplug anything from any port, especially the expansion or user port, while your computer is on.

► If you have problems running a program, try unplugging your joystick or other input device, plug-in cartridges, interfaces and all unnecessary peripherals. This may solve the problem.

► Read your computer and peripheral manuals; the 64 or 128 *Programmer's Reference Guide* can also come in handy. Become familiar with them and your system. You'll be able to pinpoint problems quickly and avoid a great deal of frustration.

► Take frequent breaks from computing to avoid visual and muscle fatigue.

► Use a comfortable chair that helps you maintain good posture when computing.

► Each time you use a program, adjust the monitor screen's color to your specifications to make it easier on your eyes.

► Use anti-fog/anti-static eyeglass spray to help keep your monitor screen dust free.

THINGS YOUR MOTHER ALWAYS TOLD YOU

(Or, housekeeping hints.)

► Keep your computer desk and work area clean and organized.

► Don't keep your computer system in the kitchen, where grease, smoke and steam can affect it.

► Don't eat, drink or smoke around your equipment.

► Before typing on your computer, wash your hands if they're greasy or covered with newsprint.

► Handle the keys gently. Press them down; don't hit them.

► Don't let young children play unsupervised with your equipment. ►

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► Keep pets away from your computer.

► Try to take at least one computer course (adult ed, college level, for beginners only, etc.) to learn the fundamentals of computing.

► Share your knowledge with others interested in learning more about computers.

► Keep complete and accurate receipts and records of model and serial numbers and dates of purchase for all your computer hardware and software.

► Always make backups of your master and work disks.

► Heed the warnings on the backs of disk sleeves: Do not bend, drop, fold, freeze, heat, throw, spill on or sneeze on, scratch or magnetize. In other words, handle carefully and insert and remove from the drive carefully.

► Make sure write-protect tabs are securely in place; otherwise, they can become lodged in your disk drive.

► Never touch a disk's magnetic surface.

► Do not place disks on your monitor or disk drive when in operation.

► Don't distribute backup copies of commercial software to user's groups, friends, neighbors, etc.—it's immoral and illegal.

► Cover your equipment when not in use to avoid dust buildup.

► Dust your workstation carefully and frequently.

► Frequently clean your mouse according to the instructions in its user's manual.

► Make it a habit to discharge yourself of static prior to touching any equipment.

► Unplug all computer accessories and the telephone line from the modem whenever a thunderstorm is approaching or lightning is nearby.

► Don't forget to unplug your telephone line from the modem when not in use.

A Penny Saved

(Or, guidelines to reducing computing costs.)

► Check with other software owners about the programs you're interested in before purchasing them yourself. Alternatively, see if you can try a demo of the program at your local computer store before buying.

► Before buying a non-Commodore printer, ask the salesperson, or preferably a printer technician, if the machine is fully compatible with your Commodore.

► Although printer ribbon re-inking may be a way to save money, it could also ruin your print head if the re-inker contains abrasive particles. Make sure you only use ink that is specifically made for a dot-matrix head because it has lubricant in it to reduce wear.

► Print on both sides of your computer paper.

► Buy good quality disks; that is to say, those with a clear or colored reinforcement ring in the exposed part of the disk around the center hole. Disks without this protective ring may not last as long. Pennies-apiece disks will cost you in the long run.

► Commercial disk storage boxes are expensive and quickly become full. An old shoe box works just as well.

► Just as with light bulbs, turning off your monitor and computer when not in use will extend their life expectancies.

► Try to make long-distance calls to BBSs during the evening and on weekends, when telephone rates are lower.

I Didn't Know That!

(Or, insights and unique solutions.)

► Owners of 1571 disk drives should never close the drive door without a disk or insert in the drive. With nothing in the drive, the heads will come into contact with each other and damage may result.

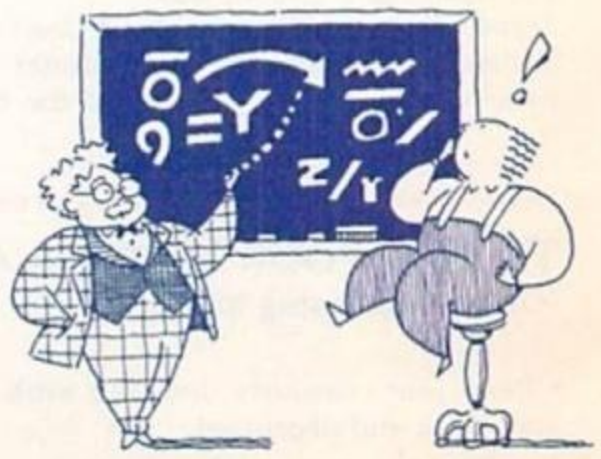
► Initialize the disk (OPEN 15,8,15, "I0:":CLOSE 15) after using commercial programs that involve a lot of access to your 1541. This will center the disk drive's head.

► Don't leave disks in a 1581 drive when you turn the power on or off. Auto-booting 1581 disks (with the 1581 as a primary drive) can be done after the computer is on by pressing the reset switch or typing "BOOT".

► C-128D owners using second drives must have the drive turned on in order for their modem to work.

► Don't use the flip sides of one-sided disks; they are unreliable.

► Unplug your power supply when you're not using your computer. Turn-



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ing off the computer does not turn off the supply; it still generates heat even when the computer is off.

► To slow down a scrolling listing or directory, press the control key on the C-64 and the Commodore key on the C-128.

► It's a bad habit to advance the printer by hand when it's turned on.

► To prevent mineral deposits on your system, use distilled water in any ultrasonic humidifier that happens to be situated anywhere near computer equipment or accessories.

ZEN AND THE ART OF TYPING

(Or, how to enter errorless listings.)

► Enter one line at a time and check for errors before entering the next line.

► Use a guide, such as a sheet of Post-it paper, under each line as you go along to help you keep your place.

► Double-check all numbers.

► Look for missing characters, missing parts of a line, or missing lines.

► Familiarize yourself with the different types of errors an incorrectly typed listing can generate.

► Refer to *RUN*'s "Troubleshooting Troublesome Type-Ins" in the May 1989 issue, and also to our Checksum program, which is published monthly.

► Give your disks meaningful and unique ID characters (the two-digit identifier placed in the upper-right corner of the disk directory).

► Put a menu program on each disk you create to facilitate accessing programs.

► Place a write-protect tab on a source disk if you're copying from it to a destination disk. It will protect against accidentally erasing the disk's contents.

► Frequently save listings as you type them in. Save files on the C-64 with SAVE "filename",8. Save files on the C-128 with DSAVE "filename".

► Familiarize yourself with abbreviations for Basic commands. You can then type in *RUN*'s listings much more rapidly.

► Check all your Data statements for errors if you get an Out of Data message.

► Try to establish a system for naming your files. For example, use all lowercase and a suffix (like the date) to help you identify them later.

► Get in the habit of not using spaces within filenames. It makes it easier to send files via telecommunications.

► When loading a file, be sure to type in the filename exactly, including spaces and punctuation, just as it appears in the directory. If you type it incorrectly, you'll encounter a File Not Found error message.

► To access your disk directory on the C-64, first type LOAD"$",8 and press return. Then type in LIST at the Ready prompt. To load a C-64 program from the directory, cursor up to the filename, type LOAD beside it, cursor over to the space following the quote after the filename, type ,8: and press return. Then, enter RUN:.

To get to the directory on your C-128 in either 40- or 80-Column mode, simply press the F3 key. To load in a program from the directory, move the cursor up beside the file you want to load. Type D followed by the shifted L key over the first two spaces in that line, move the cursor over beyond the filename (without erasing it) and press colon and return. At the Ready prompt, type RUN and a colon and press return. This is a great time-saver.

► Save and verify a program before running it.

LET YOUR FINGERS DO THE WALKING

(Or, how to order by mail.)

► Try to buy from mail order firms that specialize in Commodore products. If that isn't possible, buy from those that sell only computer products.

► If you call a mail-order house, ask for a delivery price and date of arrival.

► Provide a *complete* description of what you want.

► Don't send cash through the mail.

Readers: If you have ways to better computing of your own that you'd like to share with others, send them in. We'll publish them in a future issue of *RUN*.—Eds. ■

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RUN Copy 128

Try this speedy and friendly file copier that works with any two C-128-compatible disk drives.

By ED PARRY

RUN Copy 128 is a C-128 multifile/multidrive file copier that works with any two C-128-compatible disk drives. It operates just like its C-64 counterpart (published as "Friendly File Copier," *RUN*, November 1989), with the following exceptions:

1. RUN Copy 128 can copy 100, not 200, files at one time.

2. RUN Copy 128 automatically detects 40- or 80-Column mode and reacts accordingly.

3. The escape key replaces the left-arrow key for resetting the program at any input prompt.

4. File copying, with either a 1571 or 1581 disk drive, is several times faster than with RUN Copy 64, because those drives use fast serial input/output in 128 mode.

5. A bell indicates copy completion and any problems.

If you're unfamiliar with RUN Copy 64, here's everything you need to know to get the C-128 version of the program up and running.

Preliminaries

Type in Listing 1, called RUN Copy 128.Bas, using *RUN*'s Checksum program to catch any typing errors, then save it to a formatted disk that contains at least 50 free blocks. When you run the program, it translates the Data statements into machine code on your disk, displaying the Data statement line numbers as it goes. When the disk-write is complete, in about five minutes, the All Done message appears on the screen.

RUN Copy 128 can be loaded and saved like any normal Basic program. To use RUN Copy 128, reset your computer (to make sure memory is clear), then load and run the program. Loading is fast, and soon the self-explanatory main screen appears, showing fields

RUN Copy 128's main screen display.

such as filename, file type, file size, files chosen to copy, and files actually copied. The screen also offers the three options explained below.

The Copy Files Option

Copy Files, the main RUN Copy 128 option, is invoked by pressing the C key. When the program prompts you for the source and destination drive numbers, specify each by using the cursor-right key to increase the default number or the cursor-down key to decrease it, and then pressing the return key to enter your choice. You can input any numbers from 6 (for a hard drive or RAM disk program) through 30. After you've pressed the return key, the program automatically checks for the presence of each drive and, if one is missing, displays an error message.

When it has identified acceptable drive numbers, the program asks you for a copy pattern. Any standard directory pattern is acceptable, with the default being * (all files). Examples of acceptable patterns are shown in Table 1.

Next, the program reads the source directory, displays the first matching filename and asks if you want that file copied. Press Y to place the filename in the program's internal list of files to be copied, or N to exclude the filename from the list. Pressing A aborts the copy option and resets the program.

Once you've specified the files, copying begins. RUN Copy 128 uses the standard disk read/write routines, so you can copy files easily from any standard Commodore disk drive to any other.

During copying, the R/W field indicators flash back and forth to indicate which phase, read or write, the program is in. In addition, the # field shows the file number currently being copied, the To Copy field shows the total number of files to be copied, and the Copied field shows the number of files already done. The Copy Complete message appears when the entire process is finished.

You can abort a copy operation at any time by holding down the run-stop key. It may take several seconds for the abort to occur, so keep holding the key down until you see the Copy Aborted message.

Utilities, such as JiffyDOS, that speed up disk read/write operations work well with RUN Copy 128.

The Disk Command Option

This option lets you issue standard disk commands, so you can scratch files, format disks, validate disks, and so forth, from RUN Copy 128. Several examples of acceptable disk commands appear in Table 2. If you need further help, see the section on disk commands in your drive manual.

Press the @ key to activate the Disk Command option. Then use the cursor and return keys to specify the number of the drive that should receive the command. Here again, acceptable numbers range from 6 through 30.

The program verifies the presence of the drive and then prompts you for the command. Type it and press return.

RUN it right: **C-128; any two disk drives**

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After execution, the program displays the disk status as returned by the drive.

The Directory Commands Option

The third RUN Copy 128 option, for displaying disk directories, is activated much like the Disk Command wedge. Specify a drive device number with the cursor and return keys; then, at the $0> prompt, enter any valid directory pattern (see Table 1) or press return to show the entire directory.

In addition to the normal directory information, RUN Copy 128 shows how many files are in the list. At the Pause message, press any key to return to the main screen.

If you have two disk drives, you'll find RUN Copy a handy utility. R

Ed Parry, author of EBBS bulletin board software, writes programs and articles for a variety of publications.

Table 1. Examples of acceptable copy patterns.

Command	Pattern
*	All files in the directory
*=P	PRG files only
*=S	SEQ files only
A*	Files whose names start with A

Table 2. Examples of acceptable disk commands.

Command	Function
>i0	Initializes a disk (loads the BAM)
>v0	Validates (cleans up) a disk
>n0:target disk,RC	Formats a disk as the target, with an ID of RC
>n0:erase disk	Erases a formatted disk
>u0>m0	Puts a 1571 drive in 1541 mode
>u0>m1	Puts a 1571 drive in 1571 mode
>s0:filename	Scratches a file

Listing 1. RUN Copy 128.Bas program. (Available on ReRun disk. See order card facing page 16.)

```
Ø REM LISTING 1 CREATES (AND SH
  OULD NOT BE CALLED) RUNCOPY 1
  28                        :REM*234
5 OPEN 8,8,8,"RUNCOPY 128,P,W"
                            :REM*172
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                         :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1           :REM*141
15 IF LEN(A$)<62 THEN 55
                            :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)        :REM*242
25 FOR I=1 TO 3Ø            :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                            :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55                 :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55                 :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                            :REM*67
5Ø NEXT:GOTO 1Ø             :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                      :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø                :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                            :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                            :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55                 :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55                 :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                            :REM*148
95 NEXT:GOTO 1Ø             :REM*16Ø
1ØØ REM MACHINE LANGUAGE FOR RU
  NCOPY 128                 :REM*219
1Ø1 DATA Ø11C211CBAØ49E2Ø3732*3
  Ø343A8AF43132382Ø42*592Ø454
  42Ø5Ø41525259             :REM*Ø
1Ø2 DATA AD4341ØØØØØØØ4C331C*Ø
  ØØØ8Ø8Ø9ØØØØØØØØØ*ØØØA9Ø
  Ø85F485F3A9Ø8             :REM*151
1Ø3 DATA 8D291CA9ØØ8D2ØDØ8D21*D
  Ø8D2D1CA9Ø52Ø2DC7A5*D7FØ182
  ØB3772Ø7DFF93             :REM*234
1Ø4 DATA 1313ØØ18A2Ø1AØ142ØFØ*F
  F2Ø7DFF1B54ØØ4C9Ø2Ø*A9ØF2ØC
  3FFA9ØØ2ØBDFF             :REM*157
1Ø5 DATA A2ØØ2Ø68FFA9ØFAE291C*A
  ØØF2ØBAFF2ØCØFFA9ØF*2ØC3FFA
  59Ø8D2C1CDØØ5             :REM*165
1Ø6 DATA 182Ø2A2Ø6Ø2Ø2A2Ø2Ø7D*F
  F9EC4524956452Ø232Ø*ØØA9ØØA
  E291C2Ø328E2Ø             :REM*41
1Ø7 DATA 7DFF2Ø4E4F542Ø5Ø5245*5
  3454E542EØ5Ø7ØØ386Ø*AØØØ8C2
  81CAØØØ84F42Ø             :REM*175
1Ø8 DATA 7DFF122Ø929DØØA9Ø185*F
  42ØE4FFFØF7C914DØ1C*AC281CF
  ØEECE281CA9ØØ             :REM*54
1Ø9 DATA 85F42Ø7DFF2Ø9D9D2Ø9D*1
  22Ø929DØØ4CD81CC9ØD*FØ11C91
  BDØØ34C331CAC             :REM*172
11Ø DATA 281CCØ1EFØC52Ø2DC7AC*2
  81C99B129C8C9ØDDØA8*A9ØØ85F
  4A92Ø4C2DC7A9             :REM*68
111 DATA Ø12Ø461FAE2B1CA9ØØ2Ø*3
  28EA92Ø2Ø2DC72ØE4FF*FØFBC9Ø
  DDØØEA9ØØ2Ø46            :REM*122
112 DATA 1FAD2B1C8D291C4C6D1C*C
  91BDØØ34C331CC91DDØ*ØCAD2B1
  CC91EFØD7EE2B             :REM*185
113 DATA 1CDØCØC911DØØCAD2B1C*C
  9Ø6FØC7CE2B1CDØBØ4C*2A1DA9Ø
  12Ø6B1FAE2A1C             :REM*221
114 DATA A9ØØ2Ø328EA92Ø2Ø2DC7*2
  ØE4FFFØFBC9ØDDØØEA9*ØØ2Ø6B1
  FAD2A1C8D291C             :REM*133
115 DATA 4C6D1CC91BDØØ34C331C*C
  91DDØØCAD2A1CC91EFØ*D7EE2A1
  CDØCØC911DØØC             :REM*18
116 DATA AD2A1CC9Ø6FØC7CE2A1C*D
  ØBØ4C7D1DA9Ø12ØB51F*AE291CA
  9ØØ2Ø328EA92Ø             :REM*169
117 DATA 2Ø2DC72ØE4FFFØFBC9ØD*D ►
```


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```
    ØØ6A9ØØ2ØB51F6ØC91B*DØØ34C3
    31CC91DDØØCAD        :REM*139
118 DATA 291CC91EFØDFEE291CDØ*C
    8C911DØØCAD291CC9Ø6*FØCFCE2
    91CDØB84CDØ1D        :REM*247
119 DATA DØ1Ø18A2ØBAØ232ØFØFF*2
    Ø7DFF2Ø2Ø2ØØØ6ØEE3Ø*1C18A2Ø
    BAØ232ØFØFFA9        :REM*199
12Ø DATA ØØAE3Ø1C4C328EDØ1Ø18*A
    2Ø9AØ222ØFØFF2Ø7DFF*2Ø2Ø2ØØ
    Ø6ØEE311CAD31        :REM*117
121 DATA 1CDØØ3EE321C18A2Ø9AØ*2
    22ØFØFFAD321CAE311C*4C328ED
    Ø1Ø18A2ØBAØ17        :REM*21Ø
122 DATA 2ØFØFF2Ø7DFF2Ø2Ø2ØØØ*6
    ØEE2F1C18A2ØBAØ172Ø*FØFFA9Ø
    ØAE2F1C4C328E        :REM*49
123 DATA 18A2Ø9AØØF2ØFØFF2Ø7D*F
    F2Ø2Ø2ØØØ18A2Ø9AØØF*2ØFØFFA
    9ØØEE2E1CAE2E        :REM*4Ø
124 DATA 1C4C328E18A2Ø9AØØ72Ø*F
    ØFF2Ø7DFF2Ø2Ø2Ø2ØØØ*18A2Ø9A
    ØØ72ØFØFFAØ12        :REM*245
125 DATA B9B1292Ø2DC7C8CØ15DØ*F
    56Ø18A2Ø7AØØ72ØFØFF*AØØ2B9B
    1292Ø2DC7C8CØ        :REM*24
126 DATA 12DØF56Ø18A2Ø7AØ1E2Ø*F
    ØFF2Ø7DFF2Ø2Ø2ØØØ18*A2Ø7AØ1
    E2ØFØFFAEB129        :REM*146
127 DATA ADB2294C328E4818A2Ø9*A
    Ø152ØFØFF68DØØB2Ø7D*FFØ5D29
    A2FØ5D7ØØ6ØC9        :REM*236
128 DATA Ø1DØØD2Ø7DFFØ512D292*9
    A2FØ5D7ØØ6Ø2Ø7DFFØ5*D29A2F1
    2Ø5D792ØØ6Ø48        :REM*112
129 DATA 18A2ØDAØ152ØFØFF68FØ*Ø
    5A9122Ø2DC72Ø7DFF9F*C445535
    4494E4154494F        :REM*251
13Ø DATA 4E923AØ5ØØ6Ø4818A2ØD*A
    ØØ22ØFØFF68FØØ5A912*2Ø2DC72
    Ø7DFF9FD34F55        :REM*128
131 DATA 52434592Ø53AØØ6Ø4818*A
    2ØFAØ152ØFØFF68FØØ5*A9122Ø2
    DC72Ø7DFF9F28        :REM*61
132 DATA 9EC39F29992ØC34F5Ø59*2
    ØC6494C455392Ø5ØØ6Ø*4818A2Ø
    BAØØ22ØFØFF68        :REM*36
133 DATA FØØ5A9122Ø2DC72Ø7DFF*9
    6C4524956452Ø23923A*Ø5ØØ6Ø4
    818A211AØ152Ø        :REM*2Ø9
134 DATA FØFF68FØØ5A9122Ø2DC7*2
    Ø7DFF9F289E249F2999*2ØC4495
    24543544F5259        :REM*88
135 DATA 92Ø5ØØ6Ø4818A211AØØ2*2
    ØFØFF68FØØ5A9122Ø2D*C72Ø7DF
    F9F289E4Ø9F29        :REM*82
136 DATA 992ØC449534B2ØC34F4D*4
    D414E44Ø5ØØ6Ø18A213*AØØ22ØF
    ØFFAØ24A92Ø2Ø        :REM*1Ø3
137 DATA 2DC788DØFA18A213AØØ2*2
    ØFØFF6ØA9Ø12Ø111FA2*Ø22ØC6F
    FAØØØ2ØE4FF99        :REM*196
138 DATA BØ2AA59Ø8D2C1CDØØ5C8*C
    ØFEDØEE8C281C2ØCCFF*6ØA9Ø22
    Ø111FAD2C1CFØ        :REM*19Ø
139 DATA Ø3EE281CA2Ø32ØC9FFAØ*Ø
    ØB9BØ2A2ØD2FFC8CC28*1CDØF42
    ØCCFFA9ØØ6Ø2Ø        :REM*54
14Ø DATA 7DFFØCØEØB931111ØØ2Ø*7
    DFF1FBØCØCØCØCØCØCØ*CØCØCØC
    ØCØCØCØCØCØB2        :REM*184
141 DATA CØCØCØCØCØCØCØCØCØ*C
    ØCØCØCØCØCØCØCØCØ*CØAEØDD
    D2Ø9ED2D5CEC3        :REM*136
142 DATA CFDØD92Ø56312E3Ø2Ø2Ø*1
    FDD2Ø9F322ØC4524956*452ØC64
    94C452ØC34F5Ø        :REM*125
143 DATA 4945522Ø1FDDØDABCØCØ*C
    ØCØCØCØCØCØCØCØCØCØ*CØCØCØB
    1CØCØCØCØCØB2        :REM*169
144 DATA CØCØCØCØCØCØCØCØCØCØ*C
    ØCØCØCØCØB3ØDDD2ØØ5*D752495
    454454E2Ø4259        :REM*1Ø5
145 DATA 2ØC5442ØDØ415252592Ø*1
    FDD2Ø99D55Ø44415445*3A38393
    Ø3531332Ø1FDD        :REM*1Ø9
146 DATA ØDABCØCØCØCØCØCØCØCØ*C
    ØCØCØCØCØCØCØCØCØCØ*CØCØCØB
    1B2CØCØCØCØCØ        :REM*255
147 DATA CØCØCØCØCØCØCØCØCØB3*Ø
    DØØ2Ø7DFFDD2Ø9ECE41*4D453A2
    Ø2Ø2Ø2Ø2Ø2Ø2Ø         :REM*81
148 DATA 2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø1F*D
    D2Ø9FD3495A453A2Ø2Ø*2Ø2Ø2Ø2
    Ø2Ø2Ø1FDDØDAB        :REM*169
149 DATA CØCØCØCØCØCØCØCØCØCØ*B
    2CØCØCØCØCØCØCØB2CØ*CØCØB1C
    ØB2CØCØCØCØCØ        :REM*218
15Ø DATA CØCØCØCØCØCØCØB3ØDDD*2
    Ø99D4595Ø453A2Ø2Ø2Ø*2Ø1FDD2
    ØØ5233A2Ø2Ø2Ø        :REM*14
151 DATA 2Ø1FDD2ØØ5D22FD72Ø1F*D
    D2Ø9AC24C4F434B533A*2Ø2Ø2Ø2
    Ø1FDDØDABCØCØ        :REM*27
152 DATA CØCØCØCØCØCØCØCØB1CØ*B
    2CØCØCØCØCØB1CØCØCØ*CØCØB1B
    2CØCØCØCØCØCØ        :REM*53
153 DATA CØCØCØCØCØB3ØDDD2Ø96*C
    4524956452Ø233A2Ø2Ø*2Ø1FDD2
    Ø1ED44F2ØC34F        :REM*9
154 DATA 5Ø593A2Ø2Ø2Ø1FDD2Ø9E*C
    34F5Ø4945443A2Ø2Ø2Ø*1FDDØDØ
    Ø2Ø7DFFABCØCØ        :REM*48
155 DATA CØCØCØCØCØCØCØCØCØCØ*B
    1CØCØCØCØCØB2CØCØCØ*CØCØCØB
    1CØCØCØCØCØCØ        :REM*15
156 DATA CØCØCØCØCØB3ØDDD2Ø9F*D
    34F555243453A2Ø2Ø2Ø*2Ø2Ø2Ø2
    Ø2Ø2Ø2Ø1FDD2Ø        :REM*244
157 DATA 9FC4455354494E415449*4
    F4E3A2Ø2Ø2Ø2Ø2Ø1FDD*ØDABCØC
    ØCØCØCØCØCØCØCØ        :REM*166
158 DATA CØCØCØCØCØCØCØCØCØCØ*D
    BCØCØCØCØCØCØCØCØCØ*CØCØCØC
    ØCØCØCØCØCØB3        :REM*51
159 DATA ØDDD2Ø2ØØ5C3CFDØC9C5*D
    22ØCFDØD4C9CFCED33A*2Ø1FDD2
    Ø9F289EC39F29        :REM*121
16Ø DATA 2Ø99C34F5Ø592ØC6494C*4
    5532Ø2Ø2Ø1FDDØDABCØ*CØCØCØC
    ØCØCØCØCØCØCØ        :REM*13Ø
161 DATA CØCØCØCØCØCØCØDBCØCØ*C
    ØCØCØCØCØCØCØCØCØCØ*CØCØCØC
    ØCØCØB3ØDØØ2Ø        :REM*165
162 DATA 7DFFDD2Ø9F289E4Ø9F29*2
    Ø99C449534B2ØC34F4D*4D414E4
    42Ø1FDD2Ø9F28        :REM*26
163 DATA 9E249F292Ø99C4495245*4
    3544F52592Ø2Ø2Ø2Ø1F*DDØDABC
    ØCØCØCØCØCØCØ        :REM*198
164 DATA CØCØCØCØCØCØCØCØCØCØ*C
    ØB1CØCØCØCØCØCØCØCØ*CØCØCØC
    ØCØCØCØCØCØ        :REM*114
165 DATA B3ØDDD2Ø2Ø2Ø2Ø2Ø2Ø2Ø*Ø
    5D9452ØCF4C44452ØCD*4553534
    147452ØD7494E        :REM*92
166 DATA 444F572Ø2Ø2Ø2Ø2Ø2Ø2Ø*2
    Ø1FDDØDABCØCØCØCØCØ*CØCØCØC
    ØCØCØCØCØCØCØ        :REM*34
167 DATA CØCØCØCØCØCØCØCØCØCØ*C
    ØCØCØCØCØCØCØCØCØCØ*CØCØB3Ø
    DDD2Ø2Ø2Ø9BD5        :REM*69
168 DATA 53452Ø12Ø5C3D2D3D292*2
    Ø9B4B4559532Ø544F2Ø*4348414
    E47452Ø445249        :REM*115
169 DATA 56452Ø232Ø2Ø2Ø1FDDØD*Ø
    Ø2Ø7DFFADCØCØCØCØCØ*CØCØCØC
    ØCØCØCØCØCØCØ        :REM*219
17Ø DATA CØCØCØCØCØCØCØCØCØCØ*C
    ØCØCØCØCØCØCØCØCØCØ*CØCØBDØ
    5ØDØØ2ØE4FFFØ        :REM*252
171 DATA FBC943DØØ34CED25C94Ø*D
    ØØ34C5D24C924DØØ34C*F1242ØE
    1FFDØE12Ø7DFF        :REM*127
172 DATA 1313ØØ18A217AØØØ2ØFØ*F
    F6ØA9Ø12ØFF1F2ØDØ1D*2Ø6D1C9
    ØØ8A9ØØ2ØFF1F        :REM*12
173 DATA 4C2F242Ø2A2Ø2Ø7DFF9F*1
    2C4CFD3922Ø9E3EØ5ØØ*2ØC71CA
    DB129C9ØDDØØ3        :REM*153
174 DATA 4C331CA9ØF2ØC3FFAD28*1
    CA2B1AØ292ØBDFFA2ØØ*2Ø68FFA
    9ØFAE291CAØØF        :REM*227
175 DATA 2ØBAFF2ØCØFF2Ø2A2Ø2Ø*7
    DFF9FD354415455553Ø5*3A2Ø1CD
    354414E444259        :REM*38
176 DATA 9D9D9D9D9D9D9DØ5ØØA2*Ø
    F2ØC6FF2ØE4FF2Ø2DC7*A59ØFØF
    62ØCCFFA2ØF2Ø        :REM*63
177 DATA C3FFA9ØØ2ØFF1F4C2F24*A
    9Ø12ØD61F2ØDØ1D2Ø6D*1C9ØØ8A
    9ØØ2ØD61F4C2F        :REM*149
178 DATA 242Ø2A2Ø2Ø7DFF129F24*3
    Ø929E3EØ52AØØA924A2*3ØAØ3A8
    DAE298EAF298C        :REM*195
179 DATA BØ29A92A8DB129AØØ12Ø*C
    91CADB129C9ØDDØØ34C*331CAD2
    81C18AD281C69        :REM*196
18Ø DATA Ø3A2AEAØ292ØBDFFA2ØØ*2
    Ø68FFA9Ø2AE291CAØØØ*2ØBAFF2
    ØCØFFA9932Ø2D        :REM*23
181 DATA C7A99F2Ø2DC7A9FE8D27*1
    CA2Ø22ØC6FF2ØE4FF2Ø*E4FF2ØE
    4FF2ØE4FF2ØE4        :REM*149
182 DATA FFAA2ØE4FF2Ø328EA92Ø*2
    Ø2DC72ØE4FF2Ø2DC7DØ*F8EE271
    CA9ØD2Ø2DC72Ø        :REM*96
183 DATA E1FFFØ282ØE4FF2ØE4FF*D
    ØD4A9ØØAE271C2Ø328E*2Ø7DFF2
    Ø444952454354        :REM*119
184 DATA 4F52592Ø454E54524945*5
    32EØDØØ2ØCCFFA9Ø22Ø*C3FF2Ø7
    DFFØD2Ø2Ø2Ø2Ø        :REM*24Ø
185 DATA 2Ø9E2D2Ø5Ø4155534520*2
    DØ7Ø5ØØ2ØE4FFFØFB4C*331C2Ø2
    A2ØA9Ø12Ø8B1F        :REM*235
186 DATA 2Ø7D1D9ØØ8A9ØØ2Ø8B1F*4
```


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    C2F242Ø2A1DBØF3AD2B*1CCD2A1
    CDØ252Ø7DFF9E          :REM*253
187 DATA C4524956452Ø2327532Ø*4
    3414E27542Ø42452Ø54*4845205
    3414D452EØ5ØØ          :REM*128
188 DATA 4CFØ252Ø2A2Ø2Ø7DFF9F*C
    34F5Ø592ØDØ41545445*524E2Ø9
    E243Ø3AØ52AØØ          :REM*245
189 DATA A924A23ØAØ3A8DAE298E*A
    F298CBØ29A92A8DB129*AØØ12ØC
    91CADB129C9ØD          :REM*171
19Ø DATA DØØ34C331C2Ø2A2Ø2Ø7D*F
    F9ED2454144494E472Ø*D34F555
    243452ØC44952          :REM*214
191 DATA 4543544F5259Ø5ØØA9Ø1*2
    Ø111FA2AFAØ2B86FB84*FC18AD2
    81C69Ø3A2AEAØ          :REM*136
192 DATA 292ØBDFFA2ØØ2Ø68FFA9*Ø
    2AE2A1CAØØØ2ØBAFF2Ø*CØFF9ØØ
    8A9Ø22ØC3FF4C          :REM*3Ø
193 DATA 331CAØØØ8C271CA2Ø22Ø*C
    6FFAØØØ2ØE4FFC8CØ22*DØF8A9Ø
    D2Ø2DC72ØE4FF          :REM*21
194 DATA 8DB1292ØE4FF8DB229AØ*Ø
    2A9AØ99B129C8CØ12DØ*F82ØE4F
    FA69ØDØ5BC922          :REM*46
195 DATA DØF5AØØ22ØE4FF99B129*C
    8A69ØDØ4AC922DØF188*A9AØ99B
    1292ØE4FFC92Ø          :REM*68
196 DATA FØF98DC3292ØE4FF8DC4*2
    92ØE4FF8DC529AØØØEE*271CB9B
    12991FBC8CØ15          :REM*56
197 DATA DØF618A5FB691585FB9Ø*Ø
    2E6FC2ØE4FFDØFB2ØE4*FF2ØE4F
    FFØØ34CE226A9          :REM*72
198 DATA ØØ2Ø111F2ØCCFFA9Ø22Ø*C
    3FFAD271CC9Ø1BØØ34C*331CA2A
    FAØ2B86FB84FC          :REM*233
199 DATA A9ØØ2Ø1B1EA2E3AØ3386*F
    D84FEA9ØØ2Ø6E1EAØØØ*8C2E1C8
    C2F1C8C3Ø1CB1          :REM*247
2ØØ DATA FB99B129C8CØ15DØF618*A
    5FB691585FB9ØØ2E6FC*2ØDB1E2
    ØF11E2ØB51E2Ø          :REM*2Ø1
2Ø1 DATA 931E2Ø2A2Ø2Ø7DFF9FC3*4
    F5Ø592Ø5448495320*46*494C452
    Ø9E28592F4E2F          :REM*78
2Ø2 DATA 41293FØ52Ø122Ø929DØØ*2
    ØE4FFFØFBC959DØ27A9*Ø12Ø6E1
    EAØØØB9B12991          :REM*2Ø2
2Ø3 DATA FDC8CØ15DØF618A5FD69*1
    585FD9ØØ2E6FEAD271C*CD2E1CF
    Ø194C9827C94E          :REM*24Ø
2Ø4 DATA DØØBAD271CCD2E1CFØØA*4
    C9827C941DØBD4C331C*AD2F1CD
    ØØ34C331C2Ø2A          :REM*66
2Ø5 DATA 2Ø2Ø7DFF12C3CFDØD9C9*C
    EC792ØØA2E3AØ3386FD*84FEA2Ø
    Ø8E2E1CAØØØ8C          :REM*228
2Ø6 DATA 311C8C321CB1FD99B129*C
    8CØ15DØF618A5FD6915*85FD9ØØ
    2E6FE2ØDB1E2Ø          :REM*246
2Ø7 DATA F11E2ØB51E2Ø931EA94Ø*A
    23ØAØ3A8D93298E9429*8C9529A
    ØØØB9B3299975          :REM*1ØØ
2Ø8 DATA 29999629C8CØ1ØDØF2A9*2
    C997529999629B9B329*C899752
    9999629C8A92C          :REM*71
2Ø9 DATA 997529999629C8A95299*7
    529A957999629A914A2*75AØ292
    ØBDFFA2ØØ2Ø68          :REM*Ø
21Ø DATA FFA9Ø2AE2A1CA82ØBAFF*2
    ØCØFFA917A293AØ292Ø*BDFFA2Ø
    Ø2Ø68FFA9Ø3AE          :REM*12Ø
211 DATA 2B1CAØØ12ØBAFF2ØCØFF*A
    9ØØ2Ø4Ø1E2Ø452Ø2ØE1*FFDØØ7A
    9Ø18D2D1CDØØD          :REM*236
212 DATA 2Ø6A2ØA9Ø12Ø4Ø1EAD2C*1
    CFØE42ØCCFFA9Ø22ØC3*FFA9Ø32
    ØC3FFA9ØØ2Ø11          :REM*168
213 DATA 1FA9Ø12Ø1B1EAD3Ø1CCD*2
    F1CFØØ34C4A28A9ØØ2Ø*8B1F2Ø2
    A2ØAD2D1CFØ1E          :REM*39
214 DATA 2Ø7DFF129EC34F5Ø592Ø*C
    1424F5254454421Ø792*Ø5ØØ2ØE
    1FFFØFB4C2F24          :REM*86
215 DATA 2Ø7DFF129FC34F5Ø592Ø*C
    34F4D5Ø4C4554452Ø7*92Ø5ØØ4
    C2F24                  :REM*82
216 DATA -1                :REM*74 ■
```


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Basic Takes the Wrap

Take command of your screen displays with this word-wrapping routine.

By HOWARD I. GOLDMAN

The first command a beginning Basic programmer learns is Print. Yet, even if you have years of experience, setting up an attractive screen display can be a chore. You must keep track of line lengths yourself, since Basic provides none of the automatic parsing (word-wrapping) you take for granted in your favorite word processor. And arranging text with graphics can cause endless frustration.

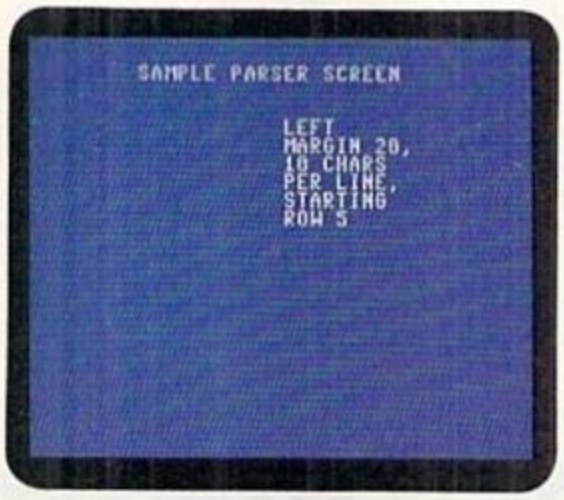
Things are easier with Parser, a short (141-byte) machine language routine that takes much of the hassle out of managing text displays. It automatically word-wraps while printing text strings to the screen, so you don't have to break messages into several lines of Print statements. Better yet, it lets you specify an exact display format, so that you can easily integrate text with character graphics.

Parser is intended for use in your own programs, not on its own. Hence, when merging it into another program, you'll probably need to renumber Parser's lines.

The program in Listing 1 is a Basic loader that reads the machine code in its Data statements and pokes the code into memory. The first step you should take is to type in the loader, using *RUN*'s Checksum program to detect any typing errors; then save it to disk before running it.

By default, the machine code is placed starting at memory location 49152. However, you can put it at any address where you're sure you have 141 bytes of memory free (the cassette buffer, or the free area at 679, for example). All you have to do is change the value of SA in line 20.

Once you've run the loader, Parser is ready to use in either Immediate or



The Parser program gives you flexibility in formatting text displays.

Program mode. The syntax is:

```
SYS SA,<text$>,<left margin>,<characters
  per line>,<starting row>
```

The Parameters

All of Parser's parameters may be either literal constants or expressions (using variables and numeric or string functions). An explanation of each parameter follows.

SA is Parser's starting address in memory (the value assigned to variable SA in the loader program).

TEXT$, the message to be printed, can be any string expression—a string variable, a literal string enclosed in quotes, or a combination of both concatenated with a plus sign. A combination expression might look like:

```
F$+T$+"PRESS ANY KEY"
```

The complete expression may contain no more than 254 characters.

The left-margin value specifies the starting column for each line of text and ranges from 0 to 39. This parameter is useful for positioning a block of text to the right of a character graphic. If the graphic extends to, say, column 14, you might set the left margin of the text to column 16.

The characters-per-line value, which also ranges from 0 to 39, specifies the maximum number of characters allowed on each line. (Of course, the number of characters actually printed on a line depends on how the words wrap.) This parameter provides an indirect way to set a right margin, enabling you to position a block of text on the left side of the screen.

Finally, the starting-row value, ranging from 0 to 24, lets you position the text vertically. Note that Parser outputs a carriage return after printing the string, so, if your text prints down to the last screen line, the screen will scroll.

Program Notes

I've made Parser as compatible as possible with other machine language routines you may use in your programs. It's relocatable, as I have mentioned, and it doesn't touch zero-page locations 251–254, which are used by many machine language programs.

Because of the C-64's 40-column screen width, the total of the left-margin and characters-per-line values you specify cannot exceed 39. You cannot, for example, specify a left margin of 10 with 32 characters per line. Basic will return an Illegal Quantity error if you exceed the limit.

Make certain that the value you supply for characters-per-line is greater than the length of the longest word in the string. If, for example, you specify a line length of 11, and there's a 15-letter word in the string, Parser will go berserk and fall into an endless printing loop.

80-Column Printers

With a couple of modifications, Parser can be used to send output to a

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printer. Use the statement:

POKE SA+73,32:POKE SA+48,81

where, again, SA is Parser's starting address in memory. This statement provides a maximum left-margin plus line-length total of 79, instead of the 39-character screen limit.

Open a file to the printer and redirect output there with the CMD statement before calling Parser; then close the output channel when you're finished. The statement:

POKE SA+73,29:POKE SA+48,41

will reset Parser for screen printing. R

Howard I. Goldman, a self-taught Basic and assembly language programmer, is also a serious performing musician.

Listing 1. Parser loader program. (Available on ReRun disk. See order card facing page 16.)

```
10 REM PARSER PROGRAM LISTING 1
                              :REM*211
20 SA=49152:REM{2 SPACEs}STARTI
   NG ADDRESS                 :REM*224
30 FORJ=0TO140:READB:POKESA+J,B
   :NEXT                      :REM*165
40 PRINTCHR$(147)             :REM*254
50 SYS SA,"LEFT MARGIN 20, 10 C
   HARS{3 SPACEs}PER LINE, STAR
   TING ROW 5",20,10,5 :REM*211
60 DATA 32,253,174,32,158,173,3
   2,163,182,134,158,132,159,13
   3,150,198,150,32     :REM*226
70 DATA 253,174,32,158,183,134,
   176,32,253,174,32,158,183,23
   2,134,165,32,253     :REM*85
80 DATA 174,32,158,183,134,146,
   24,165,176,101,165,201,41,14
   4,5,162,14,108,0     :REM*132
90 DATA 3,160,0,132,155,132,156
   ,166,146,24,32,240,255,166,1
   76,240,8,169,29      :REM*22
100 DATA 32,210,255,202,208,250
   ,24,165,156,101,165,233,1,1
   97,150,144,12,230    :REM*94
110 DATA 155,165,156,164,150,20
   0,132,156,168,208,15,168,20
   0,200,136,177        :REM*18
120 DATA 158,201,32,208,249,165
   ,156,132,156,168,177,158,32
   ,210,255,200,196     :REM*27
130 DATA 156,208,246,200,132,15
   6,169,141,32,210,255,166,15
   5,240,184,96         :REM*147 ■
```


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A Booster Shot for GEOS

GEORAM, the latest addition to the GEOS family, will give you the speed you need with either GEOS 64 or 128.

By MARK JORDAN

Anyone who has ever used GEOS knows that speed, or the lack thereof, is that system's greatest weakness. Yet there was a glimmer of hope when the 1700 series RAM expansion units (REUs) was announced by Commodore and supported by GEOS. The 1764, a 256K unit for the 64, and the 1750, a 512K unit for 128 owners, offered Commodore computerists the opportunity to run GEOS at processor speed. The results were dramatic.

The marriage of GEOS to an REU was blissful. Sadly, a lot of Commodore users never got the chance to witness such a wedding. The chip wars began, Commodore stopped making REUs, and celibacy became the technical norm. So, word that Berkeley Softworks was producing a memory expansion unit for GEOS was, well, a little like news that a whole bunch of potential brides were moving to Bachelorville!

Before describing all of GEORAM's charms, let's be clear on what it is. On the hardware side is a 512K memory expander card—about the size and shape of an eight-track tape cartridge—for use *only* with GEOS. It works on either a C-64 or C-128, is inexpensively priced ($124.95), plugs into your Commodore's cartridge port, and is *available*. On the software side is a new system disk (2.0r) that, thanks to its creation of a pseudo disk drive, performs speedy operations. Unfortunately for those who do not own GEOS, GEORAM is only for GEOS operation.

Testing Tells All

Now for those charms: speed, speed and more speed. Berkeley advertises an increase to 35 times the disk transfer speed with GEORAM, and that's a fact. As for overall operating speed, I did a series of benchmark tests with GEOS 128 and averaged the results: GEOS ran 3.5 times faster with GEORAM. Remember, however, that while using GEOS, you're doing more than just accessing the drive. For example, drawing bitmapped screens is a fairly slow, non-disk-access process that frequently occurs with GEOS and which GEORAM won't do much for. Still, you've taken a mini-quantum leap in computing power whenever you speed up anything 350 percent.

The acceleration commences at the deskTop. With GEORAM in place, as soon as you boot up GEOS and start paging through your icons, you'll notice the dramatic effects. Flip a page in 1.25 seconds, compared with 6.5 seconds to do the same with only a 1571 drive—a 520 percent increase.

Desk accessories are also accelerated. One of the most crucial, Photo Manager, is so sluggish without RAM expansion that some computerists forego using graphics in their geoPublish documents. It simply isn't worth the 12.73 seconds it takes from the time you select Photo Manager until the first photo appears. With GEORAM, it happens in a mere 2.85 seconds.

I also found there were excellent time gains in running GEOS applications, particularly geoPublish and geoPaint. Without GEORAM, it took me 32 seconds to redraw a geoPublish screen that included a bitmap, text, foreground graphics, special text, and so on. With GEORAM, that time was cut in half. Scrolling from the left side of the screen to the right took 101 seconds without and 40 seconds with.

You'll see the greatest speed improvements while moving about the screen in geoPaint. Without GEORAM, it takes over three seconds to go from point A to point B; it's less than a second with GEORAM. The speedup is more dramatic the first time you move across the screen because geoPaint spends time reallotting disk space as you increase the size of your drawing.

With GEORAM, all applications get a tremendous speed boost when dealing with files—whether saving, copying or loading them. For instance, by double-clicking a geoWrite text file from the deskTop, I was ready to type in a mere 5.7 seconds. Compare that with the interminable 24.4 seconds required to do the same when limited to a 1571 drive.

The RAM, the Shadow and Other Goodies

These speed increases are largely due to the creation of that pseudo disk drive I mentioned earlier. GEOS treats the GEORAM unit as if it's a real drive, but its limitations are electronic rather than mechanical. When you use GEORAM, you can assume, for all practical purposes, that you're reading and writing to a real disk drive. It's as easy as that.

There are a number of other efficiencies with this new system software that accompanies GEORAM. For one thing, Shadow mode increases speed in the physical drives. In this mode, GEORAM keeps a copy of files in RAM and doesn't access the drive when it doesn't need to. Another feature speeds up directories on 1581 drives by keeping the directory in RAM, a big page-flipping time-saver if you have a fairly full 1581 disk in the drive.

GEORAM also has some special goodies for the C-64 owner. First and foremost, GEORAM is 512K, not 256K as is the 1764. That means you can have an entire double-sided disk's contents in RAM. Second, GEORAM doesn't require a new power supply. A third advantage is that you can almost instantaneously re-enter GEOS from Basic. On a C-128, by using the reset switch, you can sometimes even successfully re-enter after a crash.

Say It Ain't So!

The drawbacks to GEORAM are few. With its circuit board sticking out of the

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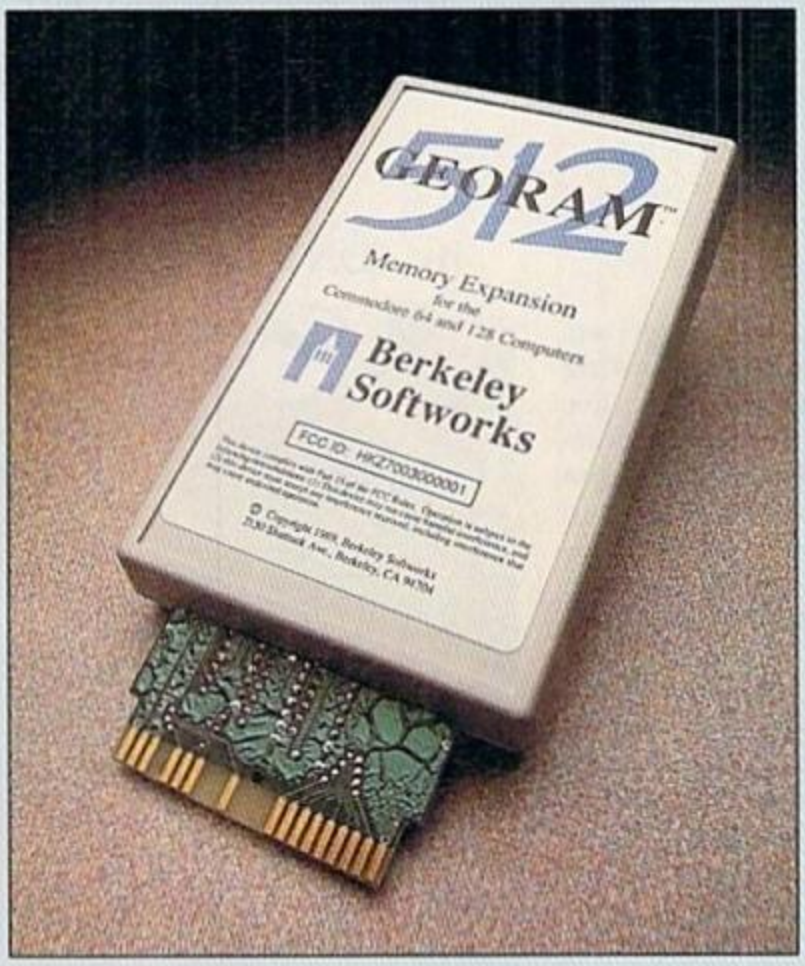
plastic case by almost an inch, the unit seems a bit unfinished. It looks something like an electronic turtle with its head sticking out. Once pushed into place, however, the board is hidden. Also, GEORAM is a space hog, taking up about an inch more room than an REU at the rear of the computer. If you've got a wall right behind your computer, be prepared for "computer shove-out shock."

Another disadvantage is that GEORAM is a tad slower than the REU, but the difference is negligible in most cases. This relative slowness is due to the fact that GEORAM doesn't use direct memory access (DMA) chips like those in the REU, and this is also the reason that GEORAM cannot be used as a RAM expander outside of GEOS.

Ironically, using any RAM expansion entails some sacrifice in efficiency. Because RAM is erased every time you power down, you must re-copy your data into and back out of RAM every time you use GEOS. That takes time and some getting used to. It's also quite possible to absentmindedly copy the contents of your RAM disk to your physical disk when you mean to do just the opposite. The result is a loss of data.

With that said, I wouldn't be without RAM expansion. In choosing between GEORAM and a 1764 or 1750 REU, I'd purchase GEORAM because it's less expensive, has a full 512K of RAM, even for the C-64, and it's probably the only one available. If you use GEOS and you don't have an REU already, dial 1-800-888-0848 (extension 1744) now; or write Berkeley Softworks at 2150 Shattuck Ave., Berkeley, CA 94704. It's time to introduce your Commodore to a frisky young filly named GEORAM. ■

Mark Jordan, author of RUN's *128 Mode column and long-time GEOS enthusiast, is a high school English teacher by profession.*



GEORAM may look a bit like a turtle, but it's fast as a jackrabbit.

GEORAM plugs into the expansion port of your computer—and protrudes considerably.

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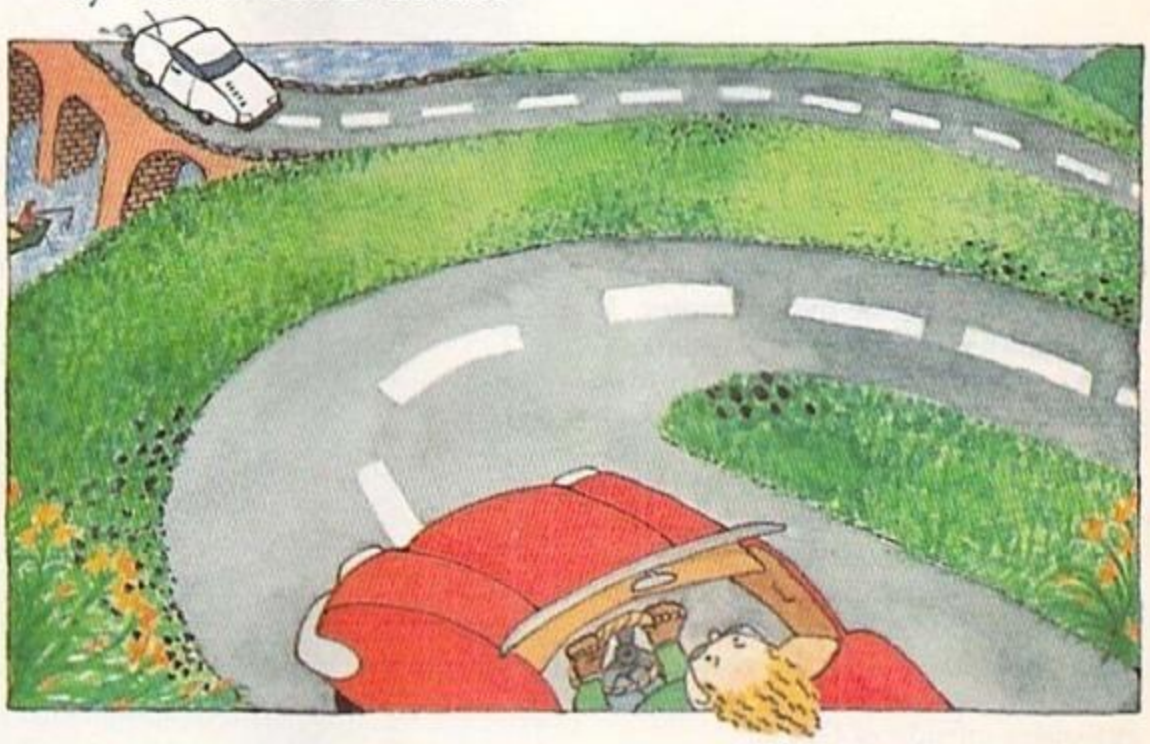
Dodge 'Em

Only your defensive driving skills will avert a disastrous head-on crash.

By TONY BRANTNER



Ever have days when everyone on the road seems to be looking for an accident? Your defensive driving skills get lots of practice, don't they? In Ram Rod, those skills are put to the test as you try to remove the dotted lines from the middle of the road while dodging a computer controlled crash car. One or two people can play at a choice of three difficulty levels.

The game screen shows four concentric rings of highway, each marked with a dotted line. Breaks in the rings enable you to drive from one road into another. The red car, which is controlled by a joystick in port 2, belongs to player 1; the green car in the two-player version belongs to player 2 and is controlled by a joystick in port 1; the computer's car is white. Running scores are displayed in the center of the screen.

At the start of each game, you can adjust the difficulty level, displayed at the top-left of the screen, by pressing F1. To change the number of players, shown at the top-right of the screen, press F3. F5 starts the action.

A game lasts five rounds, with each player having one turn per round. When you press the firebutton to begin your turn, your car starts traveling counterclockwise around the course, while the white crash car moves clockwise. Since you have no brakes, you must rely on acceleration and steering to avoid the crash car and burn up dots. Use the firebutton as a gas pedal, and, when you reach an opening, use the joystick to change lanes.

You receive ten points for each dot you erase, and your turn ends when you clear all the dots from the course or collide with the computer's car.

Using *RUN*'s Checksum program, type in Listing 1 and save a copy to disk. Then run the program to write Ram Rod to your disk. Although it's written entirely in machine language, Ram Rod can then be loaded and run like any Basic program. R

Tony Brantner, a carpenter by trade, is also a self-taught computer programmer who appreciates the C-64 for its excellent graphics potential.

Listing 1. Ram Rod creator program. (Available on ReRun disk. See order card facing page 16.)

```
Ø REM THIS LISTING CREATES (AND
   SHOULD NOT BE CALLED) RAMROD
  64                          :REM*22
5 OPEN 8,8,8,"RAMROD64,P,W"
                              :REM*49
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
   E8:PRINT:PRINT"ALL DONE!":EN
   D                          :REM*129
12 PRINT"{HOME}READING LINE "+S
   TR$(CT):CT=CT+1            :REM*141
15 IF LEN(A$)<62 THEN 55
                              :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
   2Ø)+MID$(A$,43,2Ø)         :REM*242
25 FOR I=1 TO 3Ø              :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                              :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55                  :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55                  :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                              :REM*67
5Ø NEXT:GOTO 1Ø               :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
   O 7Ø                       :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
   A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
   )):GOTO 7Ø                 :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
   Ø)+RIGHT$(A$,LEN(A$)-42)
                              :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
```

RUN it right: **C-64; one or two joysticks**

ILLUSTRATED BY LAURA JOHNSON

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```
   T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55             :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55             :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*148
95 NEXT:GOTO 1Ø          :REM*16Ø
1ØØ REM C64 RAM ROD ML  :REM*19
1Ø1 DATA Ø1Ø8ØBØ8ØAØØ9E323Ø36*3
    1ØØØØØØAØ7EB91FØE99*4ØØ3881
    ØF7AØ18B9C1ØC       :REM*121
1Ø2 DATA 99ØØD4881ØF7A9ØØ8D15*D
    Ø8D17DØ8D1BDØ8D1CDØ*8D1DDØ8
    D2ØDØ8D21DØA9       :REM*167
1Ø3 DATA B7AØØD2Ø1EAB2ØB9ØB2Ø*6
    EØC2Ø68ØBAD57Ø429ØF*A888B9B
    8ØC85Ø6AD76Ø4       :REM*141
1Ø4 DATA 29ØF85Ø52ØD9Ø9A9ØØ8D*9
    EØEA9ØØAØØE999FØE88*1ØFAA9D
    98D9FØEA9CØ8D       :REM*28
1Ø5 DATA A1ØEA5A229Ø3A8B9DEØC*8
    DAØØE8CACØEA5A2293C*18695C8
    DA2ØEA9Ø28DAA       :REM*211
1Ø6 DATA ØE2Ø41ØAAC9EØEB9BDØC*8
    D27DØA9Ø18D28DØA9Ø3*8D15DØB
    9ØØDC291ØDØF9       :REM*97
1Ø7 DATA AD1EDØE6Ø3AC9EØEB9ØØ*D
    C4A4A4A4A29Ø1AABDBF*ØC8DØ8D
    48A25Ø3DØ4BA2       :REM*91
1Ø8 DATA ØØADA5ØEFØØ62ØA5ØA4C*Ø
    BØ9AC9EØEADA9ØE4ABØ*13B9ØØD
    CAØØ14A9ØØ5AØ       :REM*14Ø
1Ø9 DATA Ø34ABØ152Ø6BØA4CØBØ9*B
    9ØØDC4A4AAØØ24A9ØFØ*AØØØ4A9
    ØEB2ØB1ØA2ØFE       :REM*2Ø6
11Ø DATA ØAADADØEC99ØDØØ62ØØC*Ø
    A4C8AØ9A5Ø325Ø6DØ2C*A2Ø1ADA
    6ØEFØØ62ØA5ØA       :REM*8
111 DATA 4C4DØ9AØFFADACØECDAB*Ø
    EDØØ62ØB1ØA4C4DØ99Ø*Ø2AØØ11
    8986DAAØE29Ø3       :REM*58
112 DATA A82Ø6BØA2Ø41ØAA9418D*Ø
    BD4A2Ø32ØDØØ9AD1EDØ*DØØ34CB
    6Ø8A28Ø8E12D4       :REM*44
113 DATA E88E12D4AØØØ8CØBD498*2
    9Ø78D27DØ8D28DØØAØA*ØAØA8DØ
    FD4A9Ø22Ø39ØA       :REM*146
114 DATA C8CØ219ØE62Ø6EØCEE9E*Ø
    EAD9EØEC5Ø5BØØ34C65*Ø8ACAFØ
    7C8CØ36BØØ68C       :REM*241
115 DATA AFØ74C6ØØ8A9ØØ8D15DØ*8
    5C6A217AØØD182ØFØFF*EE86Ø2A
    99DAØØD2Ø1EAB       :REM*5Ø
116 DATA A9Ø32Ø39ØA2ØE4FFC92Ø*D
    ØE24C3AØ8AØØØC8DØFD*CADØFA6
    ØA217AØ1Ø182Ø       :REM*38
117 DATA FØFFA9ACAØØD2Ø1EABAD*B
    DØCA2ØC2ØFBØ9A5Ø5C9*Ø29Ø15A
    2ØDADBEØC8D86       :REM*8Ø
118 DATA Ø2AØØF182ØFØFFA991AØ*Ø
    D2Ø1EAB6ØA9418DØBD4*A9Ø485Ø
    4A2ØAAØ148CØ8       :REM*169
119 DATA D48C2ØDØA9Ø32Ø39ØA18*9
    86914A8CADØEDC6Ø4DØ*E5A9ØØ8
    DØBD48D2ØDØ6Ø       :REM*12
12Ø DATA 1865A2C5A2DØFC6ØA2Ø1*B
    DA9ØE29Ø11869ØD9DF8*Ø78AØAA
    8BD9FØE99Ø1DØ       :REM*244
121 DATA BDA1ØE99ØØDØCA1ØE3AD*A
    4ØEØAØDA3ØE8D1ØDØ6Ø*989DA7Ø
    EØA187DA7ØEØA       :REM*157
122 DATA A8A9Ø685Ø4BD9FØED9ØA*Ø
    DDØ1ØBDA1ØED922ØDDØ*Ø8BDA3Ø
    ED93AØDFØØ8C8       :REM*11
123 DATA C6Ø4DØE34CB1ØAA91Ø9D*A
    5ØEB952ØD9DABØEBCA7*ØE2ØEØØ
    ADEA5ØEFØØ16Ø       :REM*255
124 DATA AØØFBD9FØED9DAØCDØ1Ø*B
    DA1ØED9EAØCDØØ8BDA3*ØED9FAØ
    CFØØ6881ØE54C       :REM*185
125 DATA DDØA18BDA9ØE7DBBØC29*Ø
    39DA9ØEBCA9ØE18BD9F*ØE79ACØ
    C9D9FØE18BDA1       :REM*159
126 DATA ØE79BØØC9DA1ØEBDA3ØE*7
    9B4ØC9DA3ØE6ØA9ØØ85*3BA9Ø48
    53C38AD9FØEE9       :REM*198
127 DATA 2E4A4A4AA8A9282ØAØØC*8
    8DØF838ADA1ØEE91485*FBADA3Ø
    EE9ØØ4A66FB46       :REM*49
128 DATA FB46FBA4FBB13BC92DDØ*3
    3A92Ø913BA2F5A9Ø5AC*9EØEFØØ
    4A21DA9Ø6863B       :REM*34
129 DATA 853CAØØ238B13B69ØØC9*3
    A9ØØ2A93Ø913B881ØF1*A24Ø8EØ
    4D4E88EØ4D4EE       :REM*216
13Ø DATA ADØE6ØA217AØØ1182ØFØ*F
    FEE86Ø2A96AAØØD2Ø1E*ABA9Ø32
    Ø39ØA2ØE4FFC9       :REM*2Ø8
131 DATA 85DØØEAC57Ø4A2342ØAF*Ø
    B8C57Ø44C68ØBC986DØ*ØEAC76Ø
    4A2332ØAFØB8C       :REM*6
132 DATA 76Ø44C68ØBC987DØBEA2*1
    74CFFE986FCC8C4FC9Ø*Ø2AØ316
    ØAØC8A9Ø48899       :REM*88
133 DATA 79D89941D999Ø9DA99D1*D
    ADØF1A97985A7A9Ø485*A8A9258
    5FEA91285FDA9       :REM*21
134 DATA Ø585Ø4A5A7853BA5A885*3
    CA4FEA949913B2Ø63ØC*A955913
    BA9282ØAØØCA6       :REM*176
135 DATA FDAØØØA942913BA4FE91*3
    BA9282ØAØØCCADØEEA4*FEA94B9
    13B2Ø63ØCA94A       :REM*35
136 DATA 913B18A5A7695285A7A5*A
    869ØØ85A838A5FEE9Ø4*85FE38A
    5FDE9Ø485FDC6       :REM*2
137 DATA Ø4DØA6A2ØC2ØFFE9A2ØD*2
    ØFFE9A98B853BA9Ø485*3CA9148
    5Ø4AØØØA92Ø91       :REM*32
138 DATA 3BC8913BA9282ØAØØCC6*Ø
    4DØEE6ØA4FE88A94391*3B88DØF
    B6ØA2A2A9Ø42Ø       :REM*199
139 DATA 87ØCA2B5A9Ø42Ø87ØCA2*5
    AA9Ø62Ø87ØCA26DA9Ø6*863B853
    CA2Ø4AØ1ØA92D       :REM*87
14Ø DATA 913B88881ØFAA95Ø2ØAØ*Ø
    CCADØEE6Ø18653B853B*A53C69Ø
    Ø853C6ØØØFFØØ       :REM*75
141 DATA Ø1Ø1ØØFFØØØØØØFFØØØ7*Ø
    3Ø1Ø1FFØ2Ø5Ø9Ø6ØØ28*ØØ78ØØ2
    ØØØØØØØØØØCØØ       :REM*186
142 DATA ØØFØØØØØØ14ØØ1AØAØØ*Ø
    C322F51617181D9C9B9*A981716
    151A9B9C9D925        :REM*47
143 DATA 35455525354555ØD1D2D*3
    DØD1D2D3DØØØØØØØØØØ*ØØØØØØØ
    1Ø1Ø1Ø1Ø1Ø1Ø1        :REM*3Ø
144 DATA Ø19595959595595617181*B
    9C9D9959595959595551*6171A9B
    9C9253545ØD1D        :REM*37
145 DATA 2DB1B1B1B1B1B1354555*1
    D2D3DB1B1B1B1B1B1ØØ*ØØØØØ1Ø
    1Ø1ØØØØØØØØØ        :REM*13Ø
146 DATA ØØØØØØØØØ1Ø1Ø1ØØØØØØ*Ø
    ØØØØØØ1Ø2Ø3Ø2Ø1ØØØØ*Ø1Ø2Ø3Ø
    2Ø1ØØØ1Ø2Ø3Ø2        :REM*43
147 DATA Ø1Ø1Ø2Ø3Ø2Ø1ØØ46312D*5
    34554Ø4C4556454C2Ø*2Ø46332
    D5345542Ø5Ø4C        :REM*24
148 DATA 4159455253Ø2Ø46352D*4
    24547494EØØ53434F52*452ØØ53
    Ø3Ø3Ø3ØØØ5Ø52        :REM*232
149 DATA 4553532Ø535Ø41434542*4
    152ØØ9E524F554E442Ø*2ØØ531Ø
    ØØ88E93ØD2Ø2Ø        :REM*116
15Ø DATA 2Ø2Ø2Ø2Ø2Ø2Ø9ABC12*2
    Ø92DØ2Ø122Ø92DØBC12*2Ø92DØD
    Ø2ØBC122Ø92DØ        :REM*188
151 DATA 2Ø122Ø92DØBC122Ø92DØ*Ø
    D2Ø994C4556454C2ØØ5*312Ø1FA
    C122Ø92DØBB12        :REM*74
152 DATA 2Ø92DØAC122Ø922ØA7BB*A
    C122Ø92DØBB122Ø92BA*AC122Ø9
    2BA2Ø9F5Ø4C41        :REM*6
153 DATA 594552532ØØ531ØØØØØ*Ø
    ØØØØØØØFCFCØØ3Ø3ØØØ*FFFCØØ3
    Ø3ØØØFCFCØØØØ        :REM*4
154 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ        :REM*3Ø
155 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØ333ØØØ3FFØØØ333Ø*ØØØ3ØØØ
    ØØ3ØØØØØ3ØØØØ       :REM*121
156 DATA 333ØØØ3FFØØØ333ØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ        :REM*19Ø
157 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ        :REM*19
158 DATA ØØ              :REM*19
159 DATA -1              :REM*13 ■
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GOLD MINE

Fight or flight, bobble or bounce; these tips have bite, bring trouble and trounce!

By LOUIS F. SANDER

AFTER BURNER: To get through level 3, put your plane in the lower-right corner of the screen. Enemies won't hit you. To refuel, aim for the lights near the tanker's engine. To destroy the fortress on level 7, shoot out the engines.

—SCOTT DEYOUNG
GRAND RAPIDS, MI

BATMAN: THE CAPED CRUSADER: Duck when you're up against toy penguins or soldiers. Their bullets won't hit you. You can't climb ladders that are facing you. Climb ladders positioned sideways.

You can usually get an enemy off the screen by high-kicking him repeatedly. On a roof, high-kick your man while facing the edge; he might fall.

—DARRELL BUCKHAULTS
ADDRESS UNKNOWN

BUBBLE BOBBLE: In some circumstances, a valuable door will appear. This screen, containing a cute character and some diamonds, is worth 400,000 points or more. For the door to appear, you must have the red tennis shoe from the first level, and you must keep it to level 20. If you get an umbrella between levels 15 and 20, the door will appear on the next screen past number 20.

Often, another shoe on levels 17 and 33 gives your brontosaurus more speed but doesn't count toward the door. If the shoe doesn't appear on the first screen, press Q to quit, then restart the game until it does.

While it's possible to get over a million points without a door, I doubt if you'll reach two million without it. As long as you keep the original shoe, doors normally appear on levels 20, 30, 40, and so on.

Avoid umbrellas in early levels, since they take you past the levels that can give you bonuses and lots of points. An umbrella on level 11 will take you past 13, a particularly tricky level. Umbrellas past 15 are usually helpful.

Yellow, green or pink bottles place some items on the screen, each worth 500 points. Pick them all up to get an extra 100,000 points. On some levels, notably 2, 14, 15, 20 and 25, it seems impossible to get them all.

The red ring allows extra points for running, the pink one for jumping and the blue for blowing bubbles.

The red lamp gives rapid firing power, which continues to the next screens if you don't get hit, and extra points for running. The yellow one allows rapid firing.

When the letters spell EXTEND, you get an extra man. Don't take risks to get letters, though, because the extra man isn't worth losing a man and all your extra powers.

—MARY WILSON
CLEARWATER, FL

F-14 TOMCAT: This helps you land safely on a carrier: Line up with the carrier, bring thrust to one-third full power, dive to 100 feet. When the stern of the carrier goes by, gently lower your nose. After touchdown, turn off your engines.

—JAMES ANTHONY FOGARTY
VIRGINIA BEACH, VA

FLIGHT SIMULATOR II: In Editor mode, change the plane's acceleration number to 65535 after take-off to improve its ability to perform stunts. The plane will accelerate to 4000 rpm, using no fuel as far as I can tell.

—BRETT DE JONG
FORT DEPOSIT, AL

INDIANA JONES AND THE LAST CRUSADE: In the first level, climb down the first rope and stop just before reaching the ledge. Wait for the man to shoot, then continue down. Go to the right until you reach the rope at the end of the first tunnel. Wait for the guy to climb down the rope and back up, then grab the torch and follow him up. Continue to the next level. Walk to the right, then jump onto the first rope. Climb down and jump onto the second rope. Climb until you can't go further, then jump to the left. You should hit the top of the platform and jump all the way to the bottom. Continue to the left and up the castle wall. In the third level, the diary is on the bottom-left corner of the airship. The exit is in the middle of the right side. Get the diary and exit the airship. In the final level, speed is the key to success. Jump over the blades and jump from tile to tile, remembering the letters on the tiles, since you'll repeat the process later with false tiles. Jump onto the correct tiles and get the grail.

—BRUCE STUART
HEALDSBURG, CA

JORDAN VS. BIRD: On dunks like Kiss the Rim, pull down while in the air. On the Two-Hand Hammer and similar dunks, pull diagonally left and down.

—BIFF TANNEN
HILL VALLEY, CA

PLATOON: Find the secret explosives to destroy the bridge. Then find a flashlight and map in one of the houses. Now go to the largest hut. Go right until you find a door in the floor. Stand on it and press the firebutton. It leads to the underground tunnels.

—CHRIS DENICOLA
HAZLETON, PA

QIX: To pass a level quickly and easily, draw little boxes leading towards the top. When the Sparx come, draw a line out to the side. When you reach the top, the Qix will have to move to one side of the screen. The other side will be colored in.

—RYAN ONEGLIA
LITCHFIELD, CT

ROCKET RANGER: When you catch up with the zeppelin, earn her trust by saying: You'll never believe me; I'm only here to help; I want to help you; Let's start again. On the sequence with both of you in the electric chair, say: Okay, ►

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I'll talk; Let me go first; Let the girl go, then I'll talk.

—Cameron Frye
Chicago, IL

Pool of Radiance: To double your experience, boot the game and load a saved game. Remove all the characters from your party, then turn the computer off and back on. Reboot the game, but don't load the saved game; just add the characters back to the party. When you begin adventuring, you'll start at the beginning of the game, but with all your previous supplies and experience. Go through the easy stuff again, doubling your experience and the important items you found the first time. Repeat this as often as you want.

When you find an item to copy, copy your Save disk or make another Save disk. Remove from the group the person with the item you want copied. Add him back to your party and trade the item(s) or money to the other characters. Now put the copy you made back into the drive. Remove the character who previously had the item(s) or money. Put the original disk back into the drive and add the character to the party. He'll have all the equipment he had before, and the other characters will have the equipment he traded them. Do this as many times as you like.

—Scott Constantine
Aurora, CO

SimCity: To build land in the water, first build power lines and/or roads out into the water where you want the land to be. Set fire to all the roads and power lines you built in the water; then bulldoze over the fires. You'll then have islands ready to accept your building.

—Andrew Orthmann
La Center, WA

Tetris: At level 9, the pieces drop quickly. If you've mastered that level, you probably had the music on. For a real challenge, select FX instead of MUSIC. The pieces will drop faster. Make the pieces drop slower by "rubbing" them against the sides of the board.

—Mike Pollock
Arnold, MD

RoboCop: On level 5, climb halfway up the stairs, then shoot the Thugs on the next floor.

—Jason Hammett
Address unknown ■

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128 Mode

Explore some of the best among highly useful programs that are off the beaten software track.

By MARK JORDAN

QUESTION: WHAT'S THE BEST-KEPT secret in Commodore-land? Answer: "Smallware," my term for software that often isn't available across the counter. It's a mix of public domain, shareware and inexpensive commercial software that's written by hackers, true believers and obscure programming geniuses.

This month we'll take a look at some of the best smallware that has surfaced since the 128 hit the scene. The addresses given are the most up-to-date I could find. You'll need to write the authors for price and availability.

Disk Utilities

Disk Whiz, by Kevin Hisel (2024 Greendale, Champaign, IL 61821), is *the* public domain disk utility program to have, in the opinion of almost everyone I talked to while researching this article. And I agree. It's not only fast, but also extremely attractive and intuitive in use, two qualities many smallware projects lack. Disk Whiz lets you run, print (to screen or printer), copy, rename and scratch files with ease.

It works with the 1581, knows how to handle subdirectories and reprograms the numeric keypad so you can jump nimbly about the screen. If you could place this program on all your disks and autoboot to it, you'd have one mean startup kit. I highly recommend Disk Whiz.

Speaking of autobooting, I also recommend **Autoboot Manager**, assembled by Victor Singleton (CIS #74676, 323 or Peregrine on QuantumLink). This is a compilation of programs from Kevin Hisel, Fred Bowen and Terry Ryan, three 128 programmers *extraordinaire*. Autoboot Manager enables you to create boot disks that will set their own screen colors, create a text message, boot from 64 mode, call a short machine language program, show a directory, validate a disk, and so on. It's great for creating a personalized disk. And here's the good news—it supports the 1581.

Nerd Copy, by Ed Parry (8711 Langdon Ave. #8, Sepulveda, CA 91343), may be the world's fastest-loading file copier for the 128, and it works with the 1581, 1571 and 1541. It loads in one second (I'm not exaggerating) and copies files about as fast as any program on the market.

Disk Doctor, by Kevin Hisel, and **Disk Noser**, by Ed Parry (see addresses above), are useful programs that allow you to edit your disks, sector by sector. Both have lots of options and power, though I think Disk Doctor's Hunt option, which lets you search through an entire disk for a string of characters, makes it the superior program.

Productivity Programs

I'm a teacher, and I've seen a lot of gradebook programs, but **Grade*Star**, by Tom Sipe, is tops. It's available on Loadstar-128 disk #2, from Softdisk Publishing, 606 Common St., Shreveport, LA 71101; phone 318-221-8718.

Although **PenPal**, by Steve Boerner (PO Box 364, Brockport, NY 14420), dates all the way back to 1986, it's still a dandy little compiled Basic database, with an attractive and intuitive interface. Its chief drawback is that it works only in 1541 mode.

Ultraterm 2.01, also by Steve Boerner, is a program I don't have, since I don't telecompute, but all my telecomputing buddies tell me this one is a beauty. Having seen Steve's work on PenPal, I trust they are right.

I also recommend **TMDMO2.0**, by Rick Matthewson (4 Rose Rd., Rochester, NY 14624). Aside from the horrendous name of this program (sorry, but I like to be able to pronounce names), this text manager is excellent. It's designed to create or edit files for sending via modem, but I found it useful for doing various other things, such as 1581 partitions, SEQ/PRG capabilities, PET/ASCII translation, printing from RAM or the disk, and so on.

Programming Utilities

ML.Aid, by Joseph Caffrey (79 Kellers Lane, Plymouth, PA 18651), is a handy-dandy machine language routine that allows you to scroll up and down your 80-column Basic program lines while you edit. In addition, you can search for and replace variables or text within those lines. I love this one and use it whenever I develop Basic programs.

When you want to incorporate the 1351 mouse into your own programs, don't overlook **m.1351.128.bin**, a little machine language program by Hedley Davis and Fred Bowen that comes with the 1351. It's easy as pie to install (just put it on your disk, BLoad it, and SYS 6144). Sprite 1 becomes your pointer. Why re-invent the wheel when m.1351.128.bin (another ugly name) is as round as a 5¼-inch floppy.

Graphics Utilities

Gas! 128, by Bruce Bowden (3110-B Lawndale, Greensboro, NC 27408), is a graphics utility that specializes in 40-column wizardry. It is option-laden (sprites-to-graphic screens, 4-bit color shifts, vertical and horizontal compression, and much more) and works with Koala and Doodle! files. Moreover, it will compress files for quicker saving and loading times.

A simple graphics charmer is **Macview 128D**, by Bryan Williams (Rt. 4, Box 35, Princeton, KY 42445). Its one and only use is to show converted Macintosh files on the 80-column screen.

A Plug for the Boss

Serious 128 bargain-hunters need look no further than the 128 disks *RUN* magazine offers. These are the cream of the smallware crop. For productivity, **Super Starter Pak** contains seven 128-specific programs of extremely high quality: RUN Script 128, RUN File 128, RUN Calc 128, RUN Term 128, RUN Paint, RUN Shell, and Label Base. For entertainment, **Fun Pak 128** offers eight excellent games, four of which are 80-column goodies. The best is Bloodstar, a sophisticated strategy conquest.

Naturally, this article barely scratches the surface of the smallware mother lode. Write to me c/o *RUN* and tell me of any you use that make your computing life happy. ■

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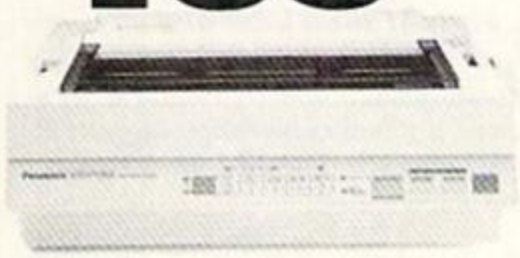

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COMMODORE CLINIC

Correcting vertical screen bounces and what to do with a defective 1351 mouse.

By ELLEN RULE

Q *Over the years, I've used a 1660 modem to access other modems and BBSs, but when I try to make a 1660 answer (pick up), I'm stumped. Will it answer, and if not, how can a call be received?*

—TED CHIDESTER
SANTA FE, NM

A First, to receive a call from another computer, set the Answer/Originate switch on the left side of the modem to A for Answer. Set the calling modem to Originate. Next, the telecommunications software must have an answer function programmed into it, along with commands that your modem understands.

The Common Sense Terminal Program that comes with the C-1660 has 1660-compatible answer capabilities. Its Ring message indicates that someone is calling you. Press the control and A keys at the same time (control/A) to answer a call. Press control/H to hang up. These features are not unique to the Common Sense program; many other commercial and public domain terminal programs have answer capabilities. The members of the BBSs that you access will probably be glad to share the name of their favorite telecommunications program.

If you want to program the modem yourself, the 1660 manual lists a series of steps required to answer a call. With a C-64 or 128:

1. Set the answer/originate switch to A (Answer).

2. To automatically answer, first detect if the phone is ringing by entering:

```
IF (PEEK(56577) AND 8)=0 THEN
PRINT "RINGING"
```

then program the phone to be off the hook with:

```
OH=56577:HI=32:LO=255-32:
POKE(OH+2),(PEEK(OH+2) OR HI):
POKE OH,(PEEK(OH) AND LO)
```

3. Program the phone to hang up when you're done with:

```
POKE OH,(PEEK(OH) OR HI)
```

By monitoring the carrier-detect line in unattended Auto Answer mode, the computer can be programmed to hang up after losing a carrier. The Basic code for this is:

```
OH=56577:
IF ((PEEK(OH) AND 16)=16) THEN
  PRINT"NO CARRIER":
IF ((PEEK(OH) AND 16)=0) THEN
  PRINT "CARRIER DETECTED"
```

Q *My 1351 mouse won't move the cursor up and down the screen. It fails after being used about an hour. I clean it regularly, and a visual examination suggests it's okay mechanically. Should I get it repaired or junk it?*

—DAVE H. SHADE
COLUMBUS, NM

A It will cost as much to repair your mouse as to buy a new one. If your mouse is defective, you may order replacement parts from an electronics supply house. A problem that develops an hour or so after being used often points to heat buildup. However, your problem is probably related to the computer chip that receives and interprets the mouse's signals. Try a different mouse; if the same problem occurs, have a technician run diagnostics on your computer to determine if a CIA chip or some other component is faulty.

Q *I use my C-64 with a TV as monitor. The TV screen bounces up and down. What can I do to correct this? I've connected it to a different TV with no luck. I tried it with a monitor at the store where I purchased my 64, and it worked fine.*

—JOHN F. MASON, JR.
BALTIMORE, MD

A You've made a good start with your troubleshooting techniques, narrowing the problem to environmental influences or faulty RF modulation. You've confirmed that the VIC chip is producing a good video signal, but haven't tested the signal after it's been modulated (within the 64) with an RF signal before it's sent to the TV.

There are some tricks you can try to determine if your C-64 is producing a defective RF signal. Try another 64 with your TV. If the problem recurs, something magnetic or electrical in the area may be interfering with the RF transmission. If this is the case, move the power supplies for your computer and drive away from the TV, without tangling the cables. Try a different TV/game switch to rule out a defect in that component. On the other hand, if a different C-64 works fine in your environment, then your 64's RF modulator is the likely culprit, and you should get it fixed.

Q *I want to learn more about my C-128, write my own programs, use Peek, Poke and CHR$ commands, use not only Basic but also machine language, and even use a modem. But most magazine articles are over my head—I can only guess at the meaning of the computer lingo. Can you help me?*

—RALPH STRACHAN
SANTA CRUZ, CA

A I credit much of what I know about computers to reading magazines such as *RUN*, and to fellow user-group members who helped me interpret what I read. Your local user group might offer beginners' classes or phone numbers staffed by knowledgeable members.

Another learning tool for a beginner is QuantumLink, the Commodore Information Network. This commercial bulletin board service (BBS) is accessed via modem and Q-Link software, which you can get by calling Q-Link's customer service at 1-800-392-8200. Or, purchase the 1660 modem offered by *RUN* (call 1-800-343-0728), which comes with Q-Link software. Once online with Q-Link, it's easy to choose your activities from the menus using the 64's cursor and function keys. Other users and Q-Guides are available to answer your questions, or you can leave questions in the message areas.

Also read the manual that came with your computer, and check out your local library and bookstores. ■

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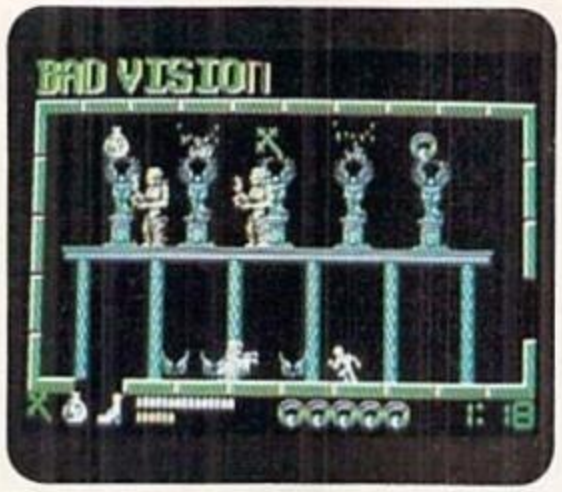
From page 16.

Frightmare, to name a few of them).

Positively packed with temples, tunnels, graveyards, pyramids and other fearful features, Nightmaresville encompasses more than 80 single-screen rooms, each sprinkled with goodies to aid your dream quest. Besides revolvers and bullets, you'll find powerful one-shot artifacts, like watches that slow time and wings that boost jumps, plus old standbys, like holy water and crosses. Movable teleporters offer quick getaways, rings confer extra lives and picking up a chalice produces an immediate status boost. Mainly, however, you score dream points by destroying monsters. Since the latter are replenished and goodies are not, the trick in each room is to maximize level gains and reach an exit that's well stocked for the next chamber's challenges.

No dream, even a really bad one, lasts forever. Each time you enter a new room, the game clock advances six minutes. Come 8:12 AM, it's morning, and you must awaken. With skill and a bit of luck, your performance will rate placement on the Top Five Dreamers roster. Hopefully, you won't be too sleepy to remember your achievement, because this roster is not maintained on disk.



Just one of many dream states in Frightmare.

Frightmare delivers good artwork and decent sound, but animation and control of your action figure qualify as barely adequate. The limited run-and-jump repertoire, aside from a magnetic stick-on look, makes getting into each room's puzzles more work than it should be. Along with no save-game feature or option to set the starting room, the result is more repetition than many players will tolerate. Fortunately, restarts are speedy, and the controls are learnable. If you don't mind numerous throwaway sessions, you could be in for many sleepless nights of Frightmarish fantasy. *(Avantage/Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128. C-64/$14.95.)*

—JEFF HURLBURT
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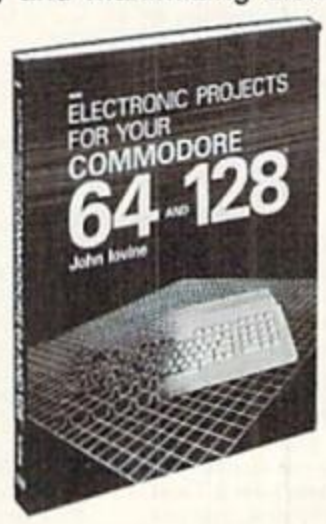

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ries of icons across the bottom of the screen lets you choose the action you wish to perform. For instance, you can communicate with non-player characters by first selecting the mouth icon and then typing your question. The only problem I had with this system is that the keys tend to repeat unpredictably, and the delete key won't erase them.

Knights of Legend offers a wide variety of magic spells, with the name of each based on the Elven language and consisting of five parts. You can build new spells by piecing together the proper syllables.

Unfortunately, Knights of Legend doesn't let you pool your characters' wealth. However, items can be transferred among your characters so you can always buy an expensive weapon with one character's gold, and then transfer it to a poorer character.

Despite the drawbacks mentioned above, Knights of Legend is a first-rate role-playing game, with images that, like most Origin games, show careful attention to detail. It comes with four double-sided, unprotected disks, a quick reference card, a map of Ashtalarea and an informative and entertaining handbook. *(Origin Systems, Inc., 110 Wild Basin Rd., Suite 330, Austin, TX 78746. C-64/$49.95.)*

—BOB GUERRA

SENTINEL WORLDS I: FUTURE MAGIC ..... A–

Someone is destroying cargo ships in the Caldorre System. Seventeen ships and many lives have been lost.

As commander of a Federation interceptor-class vessel, you and your crew of four have just undergone a grueling training program to prepare for your mission to find out what's going on and put a stop to it.

All the elements of a good role-playing game are here: You'll travel in space, decide whether to blast other ships, touch down on the planet, communicate with people on the street, discover deserted outposts, learn the politics and culture of Caldorre and explore its underground tunnels.

I had a few minutes of frustration loading the program: One disk is labeled "This Side: GAME DISK, Reverse Side: DATA DISK." The other disk is labeled "This Side: MAP DISK, Reverse Side: SAVE DISK." The first message you see after booting is "Insert Side Three." Normally, the front side of the second disk would be considered side three, but for some reason the program was looking for the back side of disk two. It later asked for side three again, but this time it would only accept the front of disk two! After I got it figured out, this turned out to be a most engaging and exciting game.

The graphics of the crew members, the planet surface and the underground are highly realistic, although the representation of your ship is a little primitive.

A very enjoyable and extensive game, SW1 should provide many hours of excitement and suspense for RPG lovers. *(Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$34.95.)*

—ART LEWIS KIMBALL

DOUBLE DRAGON II: THE REVENGE ..... A–

Alas, the joy of brothers Billy and Jimmy Lee proves fleeting. The nefarious Shadow Boss, Willy, has risen from the dead, and his first vile act was the murder of Billy's sweetheart, Marian.

You, either alone or with a friend, must battle more than 20 types of evil warriors. Your goals are the second defeat of the evil crime lord and the resurrection of Billy's girlfriend.

Divided into five difficult scenarios that must be completed within time limits, the action begins at a heliport. From there, you fight your way through a warehouse, out into the open countryside and finally to Willy's secret headquarters. Throughout the game, you use a joystick both to move in any of eight directions and to deliver blows with fists, feet and elbows.

Unfortunately, your opponents are not above using dynamite, shovels and even a ball and chain. However, you can turn the tables on your foes by seizing some of their weapons. This aspect, along with the ability to move in more than two directions, puts the software far ahead of similar contests.

DD II's graphics are generally of very high quality; however, they are, at times, marred by flickering. Also, while the control system is good, the instructions that explain it are a bit too brief. (You can overcome this by not moving forward after eliminating the game's first two nasties; you'll be able to practice all your moves in peace.)

Although it's challenging, Double Dragon II can also be very enjoyable. *(Mastertronic, 18001 Cowan St., Irvine, CA 92714. C-64/$34.99.)*

—WALT LATOCHA ■

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RUN's Checksum & Program Typing Hints

TYPE IN *RUN*'S CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running it. When typing in a program from *RUN*, first load and run *RUN*'s latest version of the Checksum program, which contains a new feature explained below. The screen will display a SYS number (49152 for the C-64; 3328 for the C-128) that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

When you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line as you typed it is correct. If the number that appears doesn't match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the appropriate SYS number, and save the finished program.

We sometimes get letters and phone calls from new readers who have typed in the Checksum program for the first time. They are confused by the "Out of Data Error in Line 30" message that appears when they try to run the Checksum program. Understandably, they compare line 30 of the listing with line 30 as they typed it in, and cannot find anything wrong. The message unintentionally misleads them into thinking the error is in line 30, whereas the typing mistake is actually somewhere in one of the Data statements in lines 190–350.

So, we've added a new feature to the Checksum program that alerts readers to the number of the Data statement line in the Checksum program where an error has actually been made. **Note that this feature works *only* on the Checksum program itself, and not on any other program listing in *RUN*.**

After you've entered and saved the Checksum program to disk, run it. If you've made any errors in any of the Data statements, the program will give you a specific line number. Find the mistake, correct it, press return, save the program and run it again. Repeat this procedure until the Checksum program runs flawlessly.

Control Characters Demystified

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key once. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACES}—press the space bar 22 times.

{SHIFT CLR}—hold down the shift key and press the clr-home key once.

{2 CRSR DNs}—press the cursor-down key twice.

{CTRL 1}—hold down the control key and press the 1 key.

{COMD T}—hold down the Commodore logo key and press the T key.

{5 LB.s}—press the British pound key (£, *not* #) five times.

Refer to the following paragraphs for any other Error messages you get from running any program listing in *RUN*.

Other Error Messages

Having heard from many users over the years about their difficulties with typing in listings, we've identified a few recurring problems that plague many people but are easy to fix. So read on and see if your problem is one of these.

- You get an "Out of Data in Line xxx" message. This means that a program line was reading from Data statements and reached the end of the data before it was done reading. There are two possible problems.

One might be with the program line that reads the data, usually a For-Next loop. Make sure you have the proper values for the loop, because if, for example, the listing has a loop of 0 to 150, and you've typed 0 to 160, you'll get the Out of Data message. If the loop is correct, then the problem lies in the Data statements themselves. One possibility is that you omitted a whole line of data. That's easy enough to find and correct. It's more likely that you've skipped one or more individual data items or typed in a period instead of a comma, which causes two data values to be read as one number. Check your typing carefully against the listing. Using *RUN*'s Checksum program when you type in listings from the magazine should help in this case.

- You get an "Illegal Quantity Error in Line xxx" message. This means you've read a number from a Data statement and tried to poke it into a memory address. The error occurs because the number is larger than 255 (the largest value a memory address can contain), which means that somewhere in your Data statements you've made an error by typing in a number larger than 255. Again, this is easy to check for and correct. First look in your Data statements for a number larger than 255. You might have added an extra digit, or perhaps you ran two numbers together (23456 instead of 234,56).
- You get a "Syntax Error in Line xxx" message. This could be almost anything. What it tells you is that there is something wrong in the indicated line. Usually you've misspelled a Basic keyword or omitted some required character. List the line and examine it carefully.
- You get an "Error in Data" message. This occurs in programs that add up all the data as read, and, when finished, compares that sum with what it should be if the data were typed in correctly. If it isn't the same, it means an error somewhere in typing the Data statements. Go back and check the data carefully. Correct the mistake(s), save the new version and try again.
- Finally, we urge everyone who intends to type in one of our listings to use *RUN*'s Checksum program, which will help you avoid every mistake we've mentioned above, except that it won't detect the omission of a line. R

Listing. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(40960)THEN MO=64:SA=49152
30 I=0:CK=0:CH=0:LN=190
40 FOR K=0 TO 16
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT
70 READ LC
80 IF LC<>CH THEN GOTO 170
90 CH=0:LN=LN+10
100 NEXT K
110 POKESA+110,240:POKESA+111,38:POKESA+140,234
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1
    60
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2
    6,165
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12
    4,189
160 POKESA+4,INT(SA/256):SYS SA:NEW
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END
180 REM DO NOT CHANGE THESE DATA STATEMENTS!
190 DATA 120,162,24,160,13,173,4,3,201,24,884
200 DATA 208,4,162,13,160,67,142,4,3,140,903
210 DATA 5,3,88,96,32,13,67,152,72,169,697
220 DATA 0,141,0,255,133,176,133,180,166,22,1206
230 DATA 164,23,134,167,132,168,170,189,0,2,1149
240 DATA 240,58,201,48,144,7,201,58,176,3,1136
250 DATA 232,208,240,189,0,2,240,42,201,32,1386
260 DATA 208,4,164,180,240,31,201,34,208,6,1276
270 DATA 165,180,73,1,133,180,230,176,164,176,1478
280 DATA 165,167,24,125,0,2,133,167,165,168,1116
290 DATA 105,0,133,168,136,208,239,232,208,209,1638
300 DATA 169,42,32,210,255,165,167,69,168,170,1447
310 DATA 169,0,32,50,142,169,32,32,210,255,1091
320 DATA 32,210,255,169,13,32,210,255,104,168,1448
330 DATA 96,104,170,24,32,240,255,104,168,96,1289
340 DATA 56,32,240,255,138,72,152,72,24,162,1203
350 DATA 0,160,0,32,240,255,169,42,208,198,1304
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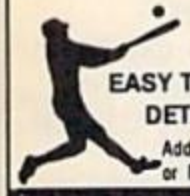

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Reader Service		Page
*	Brantford Educational Service	43
73	Briwall	15
30	Computer Shoppe of Alabama	43
166	Creative Micro Design	CII
158	Entertainment On-Line	43
61	Lance Haffner Games	25
66	Loadstar	1
*	Lyco Computer	2
47	Microcomputer Games	CIV
*	Montgomery Grant	11
221	P.A.V.Y. Software	27
15	Protecto's Computer Direct	13
232	Ramco Computer Printer	40
*	RUN GEOS Companion	CIII
	RUN Works	5
	ReRUN Back Issues	7
	GEOBASIC	8
	Voice Master Jr.	46
	Class Ads	45–47
245	Software Discounters	34
245	Software Discounters	35
17	Software Support Int'l.	17
*	SOGWAP Software	33
65	T&L Enterprises	42
*	Tab Books, Inc.	41
31	Tektonics Plus, Inc.	33
155	Tenex Computer Express	37
236	The Soft Group	40
187	Utilities Unlimited	39

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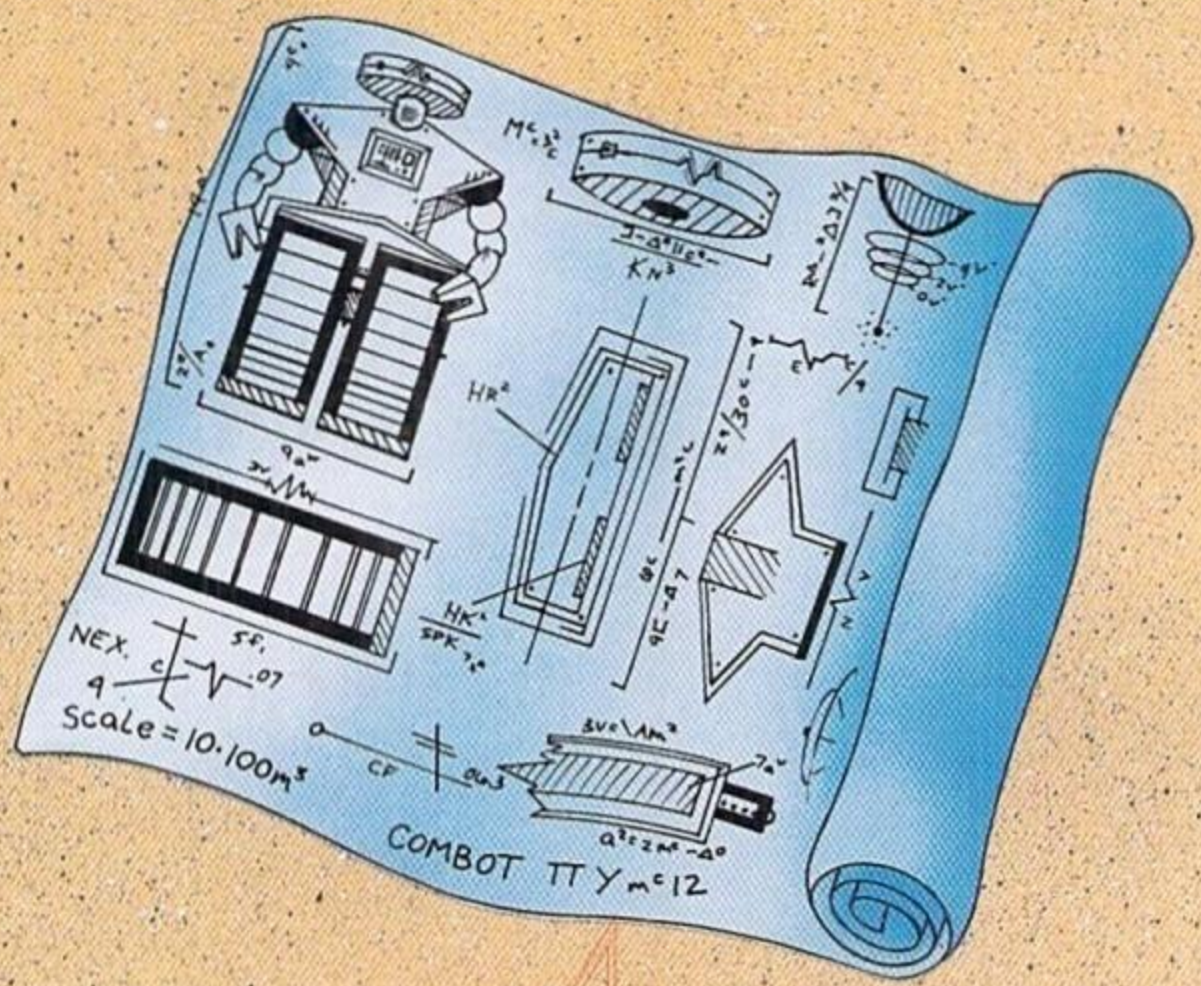

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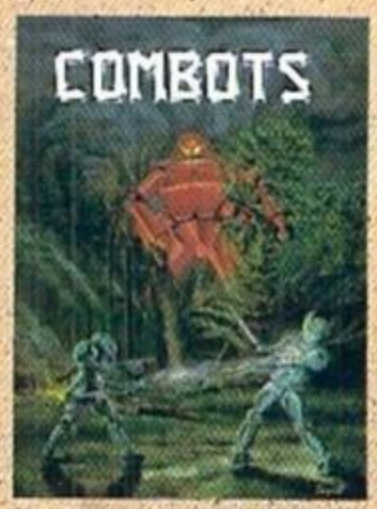

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